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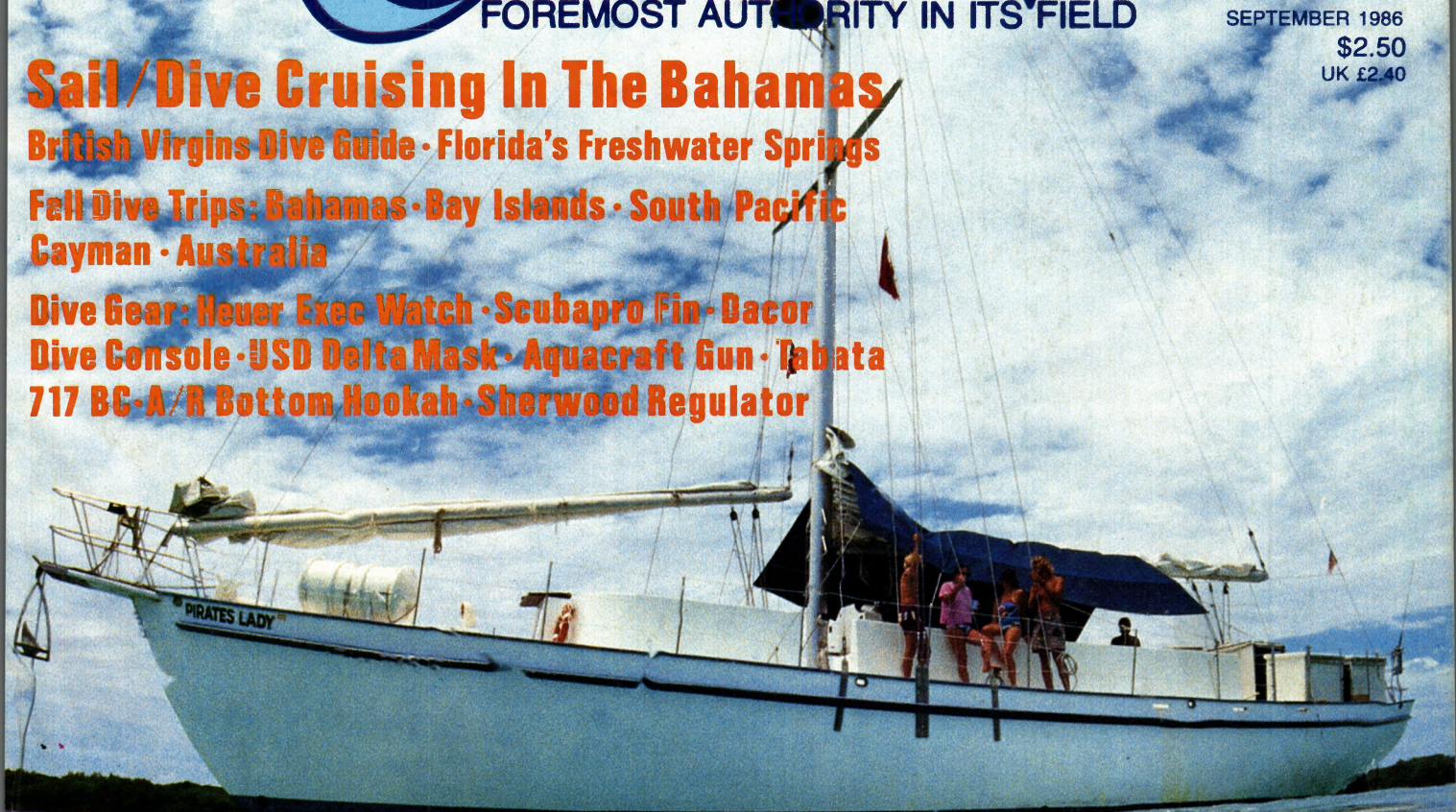
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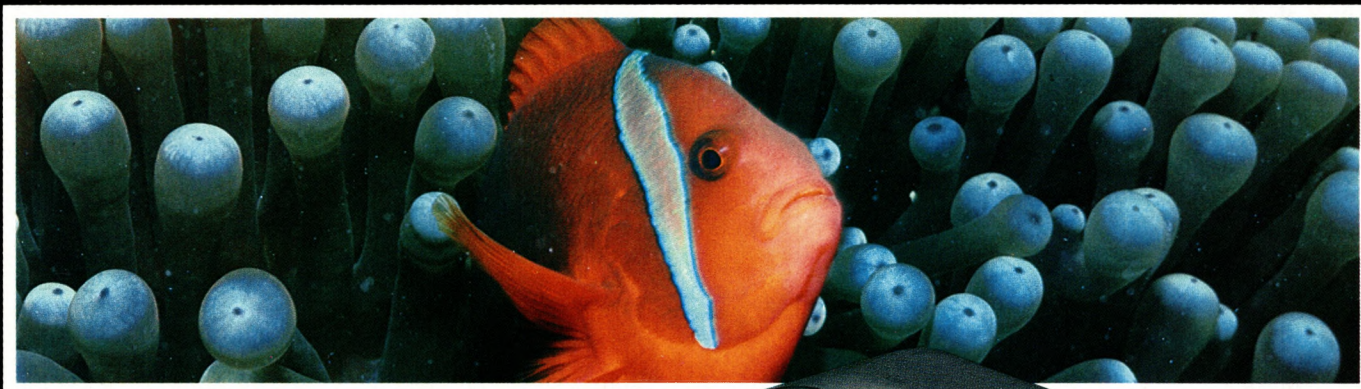
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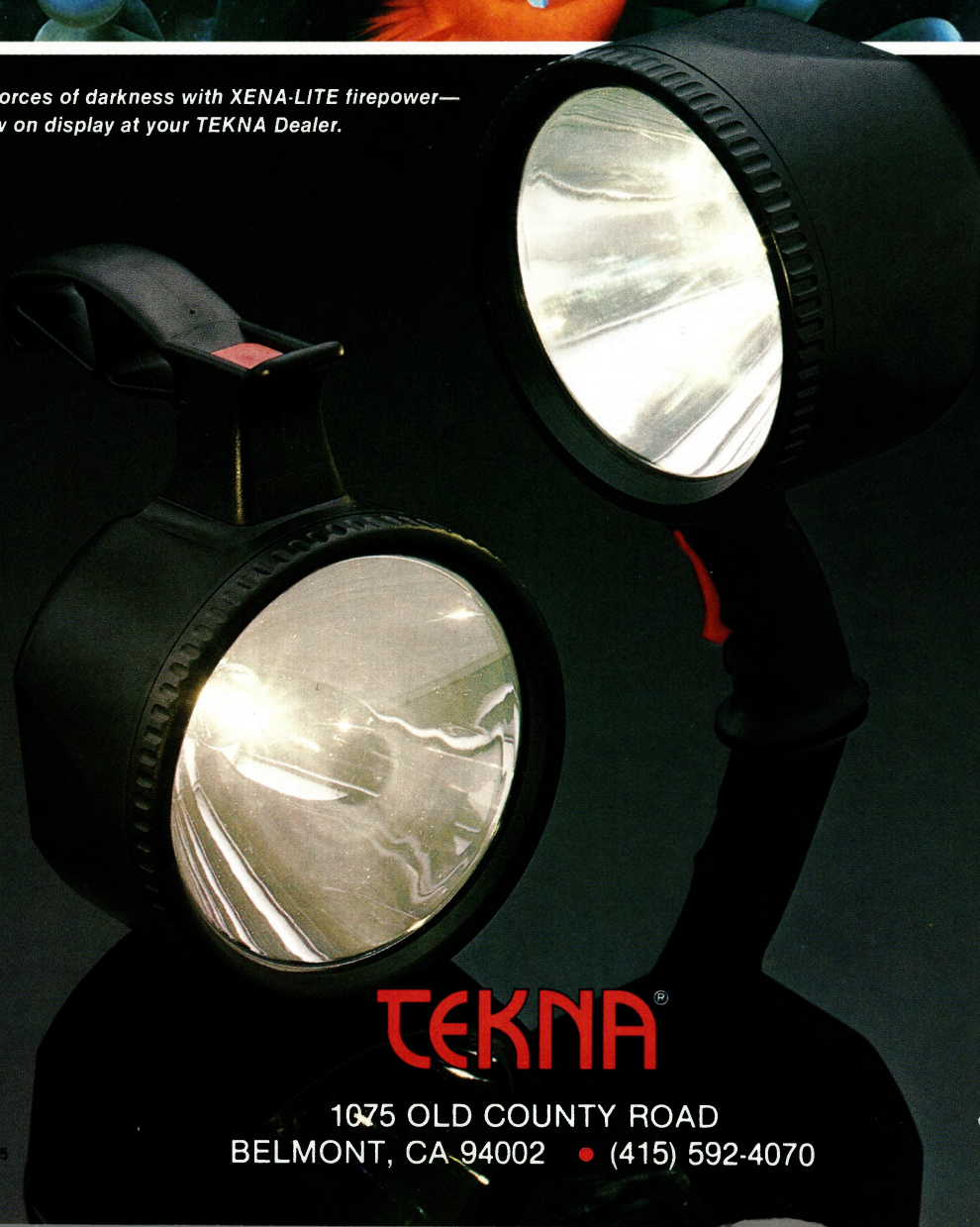


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COVER

While the sailboat, *Pirate's Lady*, rests at a quiet anchorage in the Bahamas, diver Kathleen Reinman swims below with starfish. For more on sail/dive cruises in the Bahamas, see page 84. Photo/Rick Frehsee.



A Church at Sunset/Page 76



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SDM Editorial

BY PAUL J. TZIMOULIS

FLYING AFTER DIVING—DON'T

Sport divers are a mobile society, of this there is no doubt. According to SKIN DIVER's last national survey (1985) an estimated 550,000 Americans are now traveling outside the continental U.S. for the purpose of scuba diving vacations. Dive travel has become the single largest interest in the sport today.

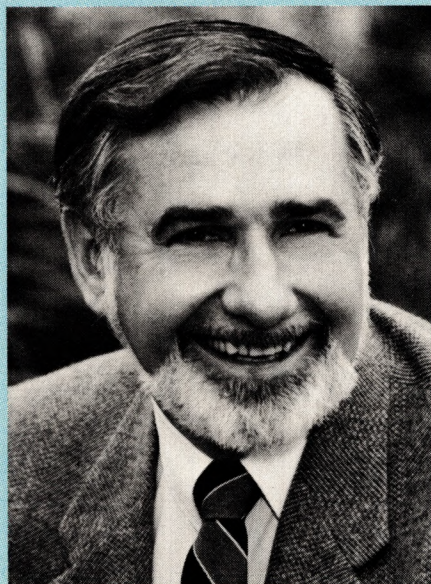
In the Caribbean alone, some 75 different islands now offer an estimated 400 different diving vacation packages. Add to this number the 35 live-aboard dive boats that ply the same sunny waters. A similar phenomenon is taking place in the Pacific, where destinations such as Hawaii, the Philippines and Australia have become popular choices.

The plane has replaced the family station wagon and modern jet travel has become commonplace. Put an airport on a tropical island and divers begin popping up like mushrooms.

However, there is a dark side to this vacation migration. Flying and diving do not mix well, especially if the flying comes right after the diving. Like most fun-loving vacationers, divers sometimes attempt to squeeze in every dive possible—right up to the moment of departure. That is when the trouble begins.

The standard U.S. Navy decompression tables (and no decompression tables) are based on returning to the surface at sea level. If you recall your basic scuba class, the atmospheric pressure at sea level is 14.7 psi. When you surface from a dive, your body is still loaded with nitrogen but sufficiently desaturated to avoid bubbling.

Using the traditional analogy, a diver who has just surfaced from a dive is very much like a walking, talking bottle of club soda with the cap firmly in place. Like the



blood in your body, the liquid appears clear and undisturbed. And, given time, the nitrogen will slowly seep out of your body and dissipate naturally.

Climbing onboard a commercial jet airliner after diving can throw a monkey wrench into this entire process. The airliner cabin pressure is not kept at sea level. In fact the term "pressurized cabin" is a misnomer. A more accurate term would be "low pressurized cabin."

The actual pressure inside a jet airliner flying at 30,000 feet is the equivalent of an altitude of 8,000 feet. This doesn't sound too bad until you realize 8,000 feet is only 0.74 ATA—26 percent less than sea level pressure.

Flying in this lower-than-sea level pressure can trigger a case of the bends. It is like popping the cap on that bottle of club soda. It could be a mild hit resulting in some sharp pains in the joints or it could be a crippling spinal hit causing long term paralysis. Bends are fickle and you can never be sure where or how they are going to strike.

By now, you are asking yourself, "How long after diving do I have to wait before I can fly?" Therein lies the source of a good deal of confusion and controversy. Over the years, the rules have been changing, as diving doctors gather more experience and case histories related to this problem.

What doctors have learned is it takes a lot longer to desaturate than was originally thought. At one time it was thought two hours surface interval was sufficient. Then it was stretched to four hours minimum and today many leading diving doctors are recommending a full 12 hours of surface time at sea level before flying.

It is for this reason many dive resorts and live-aboard dive boats prohibit any type of scuba diving on the day of departure. It is a wise rule that has probably saved many vacationing divers from a bad trip home. It is the safest and most prudent way to avoid flight bends.

Yet, the problem is more complex than might appear on the surface. The 12 hour rule works fine for a simple no decompression dive within the safe diving limits. Any sort of decompression diving, whether accidental or intentional, doubles the pre-flight waiting period. And, should a diver suffer a bends hit and be treated while on the island, the waiting period is six-fold. Decompression treatment is a very tricky business.

How do you stay out of trouble? Follow these three basic rules:

1) No scuba diving for 12 hours prior to flight time. Make sure there is a full 12 hour period between your last night dive and an early morning flight.

2) Wait 24 hours before flying after a decompression dive. These first two rules are the current policy of the Federal Aviation Administration. They are taught to all aviation medical examiners, who provide physicals for all pilots.

3) Should you be chamber treated for a case of bends or an embolism, wait at least 72 hours before attempting to fly home. The only exception to this rule would be a flight aboard a jet air ambulance pressurized to sea level.

So, the next time you are on vacation in the islands and the divemaster announces no diving on the day of departure, don't give him a hard time. And, don't try to beat the rules. It is for your own good. Flying after diving could become an expensive one-way ticket to the nearest recompression chamber. ✎

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Diver's Calendar

SAN DIEGO FILM FESTIVAL

The San Diego Underwater Photographic Society will host its 22nd annual San Diego Underwater Film Festival **September 5 and 6** at the San Diego Civic Theater. Jean-Michel Cousteau will be master of ceremonies.

Tickets, \$10 each evening, are available at the theater box office, most area dive stores, Ticketmaster and by mail. For mail order, contact the San Diego Underwater Photographic Society, c/o Tom Sullivan, P.O. Box 82782, San Diego, CA 92138 by August 22. 🌊

DIVERS SWAP MEET

The Santa Ana College Dive Club is sponsoring its seventh annual Divers Swap Meet **September 7** on the pool deck at Santa Ana College, Santa Ana, CA. Admission is free.

For information contact Jim Taylor, 22011-J Rimhurst Dr., El Toro, CA 92630. 🌊

JAPAN MEDICAL SYMPOSIUM

The ninth International Symposium on Underwater and Hyperbaric Physiology will be held in Kobe, Japan **September 16-20**. The symposium will include 140 papers on basic research in these fields and is sponsored by the Undersea Medical Society, which will hold its annual meeting in Kobe at the same time. Co-sponsors include the Japanese Society of Hyperbaric Medicine.

For information contact the Undersea Medical Society, 9650 Rockville Pike, Bethesda, MD 20814; (301) 530-9225. 🌊

AQUARIUM SHOW/PHOTO CONTEST

The Florida Marine Aquarium Society will present its 31st annual Aquarium Show and Underwater Photography contest **September 18-21** at the Museum of Science, 3280 S. Miami Avenue, Miami, FL 33129. 🌊

DIVE-IN

North Country Scuba & Windsurfing of Wolfeboro, New Hampshire will host its Dive-In at Hermit Island Campground in Bath, Maine **September 19-21**. A land and sea treasure hunt is planned. Promotional support from dive equipment manufacturers is being sought.

For information contact North Country Scuba & Windsurfing, P.O. Box 1055 South Main Street, Wolfeboro, NH 03894; (603) 569-2120. 🌊

ADAPTIVE SCUBA PROGRAM

A demonstration of adaptive scuba techniques by handicapped divers from the Moray Wheels Association of Boston will be offered **September 20** at Martini Scuba Shop, 2037 Central Park Avenue, Yonkers, New York. The demonstration is intended to create interest in an adaptive scuba program planned by the Scuba Sport Rites Club and Martini Scuba and will be presented by Rusty Murray, an occupational therapist and coordinator of the Moray Wheels Association.

For information about the program contact Mary Holzer (914) 769-5161 or write to the Scuba Sport Rites Club, P.O. Box 644, Rye, NY 10580. 🌊

YMCA SCUBA CONVENTION

The tenth YMCA Scuba Convention will be held at the Atlanta Airport Hilton in Atlanta, Georgia **September 26-28**. The program will begin with a reception on Friday evening. A range of technical papers will be presented on Saturday and Sunday. A banquet, pool games and other activities will be part of the program.

A seminar on oxygen application and accident management will be held the Thursday and Friday preceding the convention.

For information contact the YMCA Scuba Convention, 6083-A Oakbrook Parkway, Norcross/Atlanta, Georgia 30093; (404) 662-5172. 🌊

BEACH DIVE PHOTO COMPETITION

The sixth annual California Beach Dive Photo Competition, sponsored by the Underwater Photographic Society of Northern California, will be held **September 27-28** in Monterey, CA. Divers shoot one roll of film and submit their entries on Saturday; judging, awards and doorprize winners are announced on Sunday.

For information contact Kathleen Rosenberg, 15750 Via Colusa, San Lorenzo, CA 94580; (415) 276-5694. 🌊

IQ86

Florida International College in North Miami, Florida will be the site of the **October 3-5** International Conference on Underwater Education. There will be seminars, workshops and clinics. For information contact Walt Amidon, NAUI Headquarters, P.O. Box 14650, Montclair, CA 91763-1150; (714) 621-5801. 🌊

CEDAM EXPEDITIONS

CEDAM International is offering a combination marine/terrestrial archaeology expedition to the lost city of Nueva Cadiz, Venezuela, **October 3-10**. For more information contact CEDAM International, Fox Road, Croton-on-Hudson, New York 10520; (914) 271-5365. 🌊

DIVE TO ADVENTURE

Jack Mckenney's Dive to Adventure program will be presented on Saturday **October 11** at the Macon Junior College in Macon, Georgia. His films, *Seven Wonders of the Diving World*, *The Undersea Adventures of Jean Jacques Dubois*, *Ten Fathoms Deep* and *Beneath the Sulu Sea* will be featured. Admission is \$6 and reserved seats are \$15 (reserved price includes a pre-show reception).

For information contact Judy Trawick, Middle Georgia Divers, 438 Moore Road, Griffin, Georgia 30223; (404) 227-8989. 🌊

DUPONT BULL ROAST

The DuPont Employees Skin & Scuba Diving Association will sponsor a Bull Roast at St. Elizabeth's Social Hall in Wilmington, Delaware **October 11**. The feast will feature entertainment consisting of a disk jockey, an artifact display from local wrecks and slides taken by club members.

For information call Tom Bennett (302) 322-9481. 🌊

skin diver

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Scuba Quiz

Category: Physiology

Topic: Ventilatory Control

By Dennis Graver

Breathing is an automatic process on land, but it is not so automatic underwater. Even though new divers are encouraged to relax and breathe normally, respiration for diving is not that simple. See if you know as much as you should about the factors affecting how you breathe while diving. The differences among some questions are very subtle, but then so are the differences in respiratory stimulus. The answers are on the next page.

1. The stimulus to breathe is caused by:

- ☐ A. A low oxygen level in the blood
- ☐ B. A high carbon dioxide level in the blood
- ☐ C. A combination of A and B
- ☐ D. Any of the above

2. The urge to breathe is greatest when:

- ☐ A. The oxygen level in the blood is low
- ☐ B. The carbon dioxide (CO₂) level in the blood is high
- ☐ C. The oxygen level is low and the CO₂ level is high
- ☐ D. Any of the above occur

3. Because breathing is more difficult at depth, the body will accept a higher than normal level of CO₂.

- ☐ A. True
- ☐ B. False

4. When exercising underwater, there is less of an increase in

ventilation than when exercising on land.

- ☐ A. True
- ☐ B. False

5. The respiratory response to CO₂ is greater when oxygen levels are higher than normal.

- ☐ A. True
- ☐ B. False

6. Higher than normal levels of CO₂ in the bloodstream causing high breathing stimulus is termed:

- ☐ A. Hypoxia
- ☐ B. Hypercapnia
- ☐ C. Hyperpnea
- ☐ D. Dyspnea

7. The urge to breathe set point can be elevated through conditioning and training:

- ☐ A. True
- ☐ B. False

8. Skip breathing decreases the normal stimulus to breathe.

- ☐ A. True
- ☐ B. False

9. Physiological effects of CO₂ toxicity are observable when the percent of that gas in the air reaches:

- ☐ A. 10 percent
- ☐ B. 8 percent
- ☐ C. 4 percent
- ☐ D. 0.033 percent

10. CO₂ toxicity in scuba divers results primarily from:

- ☐ A. Improper ventilation
- ☐ B. Breathing resistance
- ☐ C. Dead air space
- ☐ D. Contaminated air

11. Which of the following methods is recommended to safely increase air supply duration:

- ☐ A. Paced activity
- ☐ B. Slow, deep, continuous breathing
- ☐ C. A high level of physical conditioning
- ☐ D. All of the above

12. It is unlikely a diver using large quantities of air could be rendered unconscious by excessive CO₂.

- ☐ A. True
- ☐ B. False

13. Higher than normal levels of CO₂ in the bloodstream can increase susceptibility to:

- ☐ A. Nitrogen narcosis
- ☐ B. Decompression sickness
- ☐ C. Heart rhythm changes
- ☐ D. All of the above

14. Arrange in order, from greatest to least effect, the following factors contributing to overexertion.

- ☐ A. Skip breathing and a high activity level
- ☐ B. Reduced lung capacity from immersion
- ☐ C. Tight exposure suit and a hard-breathing regulator
- ☐ D. Dead air space and breathing resistance

15. Which of the following factors is most important for ventilatory control while diving:

- ☐ A. Slow, easy movements and moderation in activity
- ☐ B. Pacing activity with frequent rest pauses
- ☐ C. Proper breathing pattern
- ☐ D. All are equally important

Scuba Quiz

Answers: Ventilatory Control

1. D. Any of the above. Ventilatory control is a process of correcting errors in oxygen and CO₂ levels within the bloodstream. Sensors in the body detect high CO₂ levels and/or low oxygen levels. The sensors for either can stimulate breathing by sending signals to the respiratory center in the brain, which, in turn, stimulates the diaphragm.

2. C. The oxygen level is low and the CO₂ level is high. A high level of carbon dioxide in the blood is a powerful ventilatory stimulus, while a low oxygen level produces a rather feeble stimulus. When both of these conditions exist, however, the breathing stimulus is greater than the sum of the responses individually. As we shall see, though, a high CO₂ level does not produce the same stimulus underwater that it does on land.

3. A. True. An increase in breathing resistance reduces the ventilatory response to carbon dioxide build-up. A high CO₂ level normally requires increased effort on the part of the respiratory muscles. Since the muscles have to work harder as breathing resistance increases, the body is tricked into accepting a higher than normal level of carbon dioxide before stimulus occurs.

4. A. True. We breathe less when exercising in water than when exerting ourselves on land for two reasons: (1) Lung capacity is only 85 percent of normal. (2) Divers are sluggish in their response to an increase in CO₂. It seems the ventilatory control system of divers is different than that of nondivers and it is quite likely the decreased response to CO₂ is developed by divers involuntarily as well as voluntarily. This adaptation is related to increased gas density and breathing resistance.

5. B. False. Another reason divers tolerate a higher than normal carbon dioxide level in the blood underwater is because the response to CO₂ is reduced when oxygen levels are higher than normal and this is the condition that exists at increased ambient pressures. This stimulus reduction adds further to CO₂ retention.

6. B. Hypercapnia. Hypoxia means low oxygen level in the tissues, hyperpnea means rapid breathing and dyspnea means difficulty in breathing. Hypercapnia is an undue amount of CO₂ in the blood, causing overactivity in the respiratory center of the brain.

7. A. True. Physical conditioning enables the body to make more efficient use of oxygen while tolerating higher than normal levels of carbon dioxide. If this effect is coupled with the other three factors contributing to higher than normal levels of CO₂ previously explained, the combined effect will be a very high CO₂ level before breathing stimulus results.

8. A. True. A low breathing frequency with breath holding between breaths maximizes pulmonary gas exchange and reduces breathing effort, but the practice also tricks the body into accepting a higher than normal level of CO₂. The major problem with skip breathing is the rapidity with which respiratory distress can occur if a problem should arise.

9. C. 4 percent. Fresh air contains about 0.033 percent CO₂. When the level reaches about four percent, the depth of respiration is doubled. At eight percent, vision is affected, nausea is experienced and air starvation occurs. Upon reaching levels of 10-15 percent CO₂, unconsciousness results. It may seem this would not be a problem when open circuit scuba gear is used, but there are other factors.

10. A. Improper ventilation. Neither breathing medium nor equipment pose problems for scuba divers as they can

for commercial divers, but breathing improperly can. Some divers establish a rapid, *shallow* breathing pattern in response to respiratory demand. This hypoventilation leads quickly to a high CO₂ and low oxygen situation and unconsciousness follows. Always breathe *deeply* when diving.

11. D. All of the above. Good physical condition is always advised for divers. Slow, deep breathing without holding the breath is the safest and most efficient way to breathe underwater. Pacing activity allows respiration to keep up with tissue needs. It is also wise to stop periodically to allow catch-up to take place if it is needed. Because the rules pertaining to CO₂ change under pressure, you may not be aware you are nearing overexertion.

12. B. False. As described in question 10, huge quantities of air can be moved through a regulator with very little of the air actually reaching the lungs. This is not hyperventilation, which is rapid, *deep* breathing, but hypoventilation—rapid, *shallow* breathing. If this is coupled with a high exertion level, trouble develops rapidly. The actions outlined in answer 11 are very important to ensure safety while diving.

13. D. All of the above. Excess carbon dioxide in the blood can temporarily enhance the effects of nitrogen narcosis and it also plays a part in decompression sickness because it comes out of solution when bubbles are formed. Heart rhythm changes while diving and breath holding have been traced to excessive CO₂. It's obvious all of these conditions must be avoided and they can be with proper breathing habits.

14. A, C, D, B. Exertion without adequate ventilatory response is very hazardous, yet divers have the ability to underventilate while overexerting. Overexertion, with its accompanying feeling of suffocation, hits suddenly and without warning. Knowing what it is, what causes it and what to do when it occurs are very important. The other factors are contributors to this problem, but not as much as improper ventilation coupled with exertion.

15. D. All are equally important. This is the bottom line for the prevention of carbon dioxide excess. Slow, deep, continuous breathing, coupled with paced activity, frequent pauses to rest and controlled activity are all strongly recommended for efficient and safe respiration while diving. Violations of these techniques invite trouble.

Did you get 11 or more correct? If so, you passed the quiz. If not, consider a good book on diving medicine or an advanced course. It amazes me to know there are four factors that tend to cause CO₂ retention in divers and we often tend to compound the problem by skip breathing. Hopefully, you now realize CO₂ excess is a problem even with proper ventilation. Note the length of time until respiratory distress occurs and difficulty arises is directly related to CO₂ retention—the higher the level, the shorter the time. Breathe properly to give yourself a margin of safety to deal with problems.

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Did you hear about the pot boat in Florida? It went up in smoke! No kidding! Val Martin, Port Salerno, Florida sent me a clipping from the Miami Herald that included a map showing the location of the wreck of the "runaway pot boat." The name of the 35 foot sportfisherman was *Profiteer*, but people refer to it as the "dope boat." The story is too dopey not to be true.

Like a raging bull on the loose, the unmanned boat—whose two crewmen had leaped overboard—cruised waters off the Dry Tortugas at speeds of 14 knots while two U.S. Coast Guard cutters tried unsuccessfully to corral it. At one point during the 62 mile chase—which lasted 11 hours—the pot laden vessel sped through a fleet of 30 shrimp boats, scattering them like a fox in a henhouse.

The 95 foot Coast Guard cutter *Cape*

one of the dopest pot boats that ever cruised the Florida Straits.

Bob Benson, Sacramento, California, is researching steamboats from the great steamboat era. He asks about the *Delta Queen*, built in 1926 and operated on the Sacramento River between San Francisco and Sacramento from 1926 to 1942. Bob, believe it or not, you can take a cruise on the *Delta Queen* today on the Mississippi and Ohio Rivers. She offers a variety of excursions year-round in the tradition of steamboatin'—stopping at all the ports made famous by Mark Twain. The *Delta Queen* was used as a ferryboat during World War II and was purchased by Tom Greene at auction in 1946. Towed more than 5,000 miles, through the Panama Canal to New Orleans, she was extensively remodeled and took her maiden passenger voyage on the Ohio

countries. The book is available from Nancy Kunkel, Naval Institute Press, U.S. Naval Institute, Annapolis, MD 21402. The price is \$28.95

Marc Cohen, Coconut Creek, Florida, asks for information on the steamer *Cayuga* that sank in Lake Michigan at the turn of the century. He also wants to know about Captain Tom Reid's efforts to salvage the wreck. Thanks to Jean Haviland, who let me borrow her book, *History of the Great Lakes*, by James Beers (out of print), I found some basic information. The *Cayuga*, a package freighter, 2,669 gross tons, was built in Cleveland in 1889. She was sunk in 1895, after colliding with the steamer, *Joseph L. Hurd*. Damage to both vessels and cargoes totaled \$300,000. In another book, *The Salvager—The Life of Captain Tom Reid on the Great Lakes*, by Mary Frances Doner



Wreck Facts

BY ELLSWORTH BOYD

Fox rescued the two smugglers, then attempted to lasso their wild bronco boat. Crewmen tried unsuccessfully to foul its propellers with rope, as the pilotless craft kept circling at high speeds. *Cape Fox* volunteers tried to board the runaway stagecoach-style and failed again. Like reinforcements for a posse, the 110 foot cutter *Sea Hawk* joined the chase. Then the pot laden boat entered a shoal near Hospital Key where the cutters couldn't follow. But the pot vessel's exit was just as surprising as its entrance. When it came cruising out, the steel hulled *Sea Hawk* rammed it. One hundred rounds from an M-60 machine gun put the wild critter to rest with some of its eight tons of marijuana still aboard. Most of the grass was set afire before the ship sank. The *Profiteer* rests on the ocean bottom 25 miles southwest of the Dry Tortugas,

River in 1948. Called "Old Man River's loveliest lady," the *Delta Queen* was restored with original teakwood handrails, stained glass windows, crystal chandeliers and a grand staircase. In 1970 she was officially listed on the National Register of Historic Places. Tom Greene owns the Delta Queen Steamboat Company, New Orleans, Louisiana, the same company that operates a sister steamboat, the *Mississippi Queen*.

Detailed information and a photo of the *Delta Queen* appear in a new book, *International Register of Historic Ships*, by Norman J. Brouver. This book has other ships in it that divers have inquired about. The armored cruiser, *Olympia* for instance and the schooner *Alvin Clark* are in the book—along with 700 other ships—all restored and on display in the United States and more than 40 foreign

photo/courtesy Patti Young, Delta Queen Co.



The *Delta Queen* still offers cruises.

(also out of print), I discovered details on the sinking. The *Cayuga* went down off the Waugoshance Point in the Straits of Mackinac amid fog, snow and treacherous currents. She was reported to be on the bottom at 100 feet with her basic machinery intact.

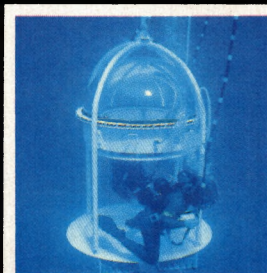
Shortly after the sinking, Captain Reid purchased expensive equipment, hired extra hands and bought a special tugboat to try and raise the *Cayuga*. Using six large steel pontoons—that cost about \$15,000—Reid's divers attached them to the wreck with cables. When the pontoons were filled with air, the cables broke one by one and a diver lost his life. The *Cayuga* is still on the bottom along with Captain Reid's pontoons.

Peter Murray, Wauwatosa, Wisconsin, needs Loran readings for some of the major wrecks off Milwaukee and surrounding regions. He has a boat equipped with Loran C and is anxious to get on some of the wrecks. If you can help, write him at: 3153 N. Knoll Terrace, Wauwatosa, Wisconsin 53222; phone (414) 475-6232.

Vince Kostoln, Flushing, New York, is trying to locate a book that is a riddle to me: *The Perils of the Port of New York*, by Jeannette Edwards Rattray. He says it's out of print. That's one I've never

(Continued on Page 28)

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Photos by LARRY CUSHMAN

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The recent update of the U.S. Navy *Diving Manual* (Revision 1, June 1, 1985) has an excellent discussion of the history of diving. The advances in diving were dependent on developments in the areas of medicine and physiology. History tells us a lot about the developments in understanding the response of the body to pressure, inert gas, temperature and other environmental stresses.

Diving began from the needs of ancient cultures for commercial use of the sea, in military activity and in exploration. The beginning of diving can be traced to a period before the time of the ancient Greeks. Early diving was used to harvest sponges, food and coral. Herodotus wrote of a diver in the fifth century B.C.

ly the limitations of this practice, for the pressure underwater makes it impossible to draw air from a surface tube below about three feet. It soon became apparent that air had to be pressurized to the depth of the diver.

The first useful solution to supplying air to a diver underwater was the diving bell. This was initially just a large, bell shaped tank, inverted to trap air as it was lowered into the water. A diver could descend in a bell and breathe the air that was trapped inside. To work, he would have to leave the bell for short periods while breath-holding. The first practical diving bells were used in the 16th century. For several hundred years this was the way salvage work was done. Astronomer Ed-

limited air supply and the diver had very little bottom time. At the beginning of the 19th century, a pump that could provide air under pressure was invented and an immediate advance in diving technology was made. After that, deepsea diving was underway. Diving suits and helmets began to appear in the late 18th century. The surface supplied suit used by most commercial divers today is a direct descendant of the suit developed by Augustus Seibe around 1840. Seibe connected the previously open helmet to a suit and added an exhaust valve to allow air to leave the helmet. For the first time, divers could remain on the bottom for prolonged periods and reports of diver's rheumatism began to appear. This disorder was, in reality, decompression sickness, but it would take another 50 years before the cause was discovered.

The problem of decompression sickness was especially severe in caisson workers. In the late 19th century there were several tunnel and bridge construction projects where many hundreds of workers were compressed for a full work shift and returned to atmospheric pressure without decompression. The disease, then known as caisson worker's rheumatism, was a serious problem. The most important contribution to understanding the disease came from Paul Bert, a French physiologist who studied both altitude and diving. His research allowed him to develop the concepts about nitrogen saturation needed to understand decompression sickness. Bert's studies provided the basis for preventing decompression sickness by slow decompression after exposure to increased pressure. By the beginning of the 20th century, we understood the concept of gas supersaturation; that bubbles formed in tissues when decompression was too fast and the bubbles caused damage that could result in paralysis or death.

At the beginning of this century, the limits on diving were about 120 feet because divers did not have safe tables for decompression. The British physiologist, J.B.S. Haldane, through careful experimental studies, worked out a method for staged decompression that allowed divers to extend their diving depth to about 200 feet. The staged decompression tables of Haldane were the precursors of the tables we use today.

Solving the problem of decompression sickness led to a new problem. When divers reached 200 feet, they discovered a feeling of euphoria and incapacitation that they called Rapture of the Deep. Research in the 1930s identified nitrogen as the cause, and the disorder was renamed nitrogen narcosis. To extend diving to deeper depths, helium was mixed in the breathing gas to prevent it. Helium is still used as the inert gas today for diving to depths greater than 200 feet. One of the first practical uses of helium in diving was

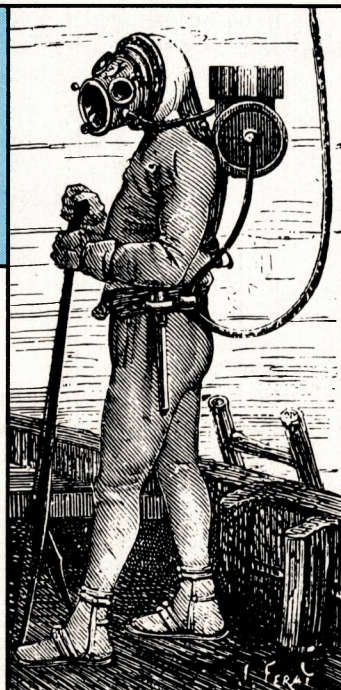
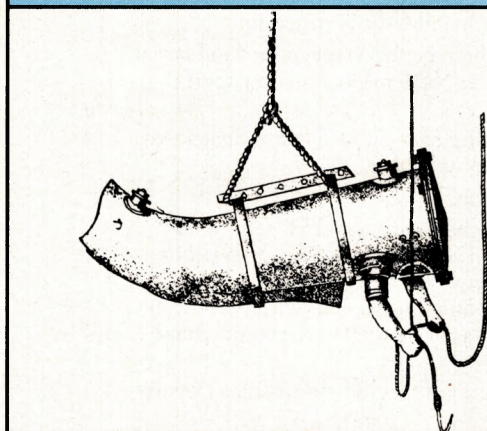
(Continued on Page 104)



Diving Medicine

ALFRED A. BOVE, M.D., PH.D.

Diving began from the needs of ancient cultures for commercial use of the sea, in military activity and in exploration. An air supply was of concern from the beginning. Diving suits and helmets began to appear in the late 18th century. Diving advanced significantly when, in the early 19th century, pumps were invented that could provide air under pressure to divers.



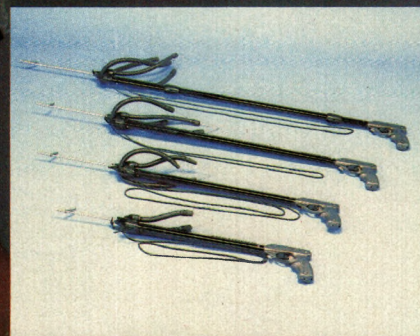
The diver recovered sunken treasure for the Persian king Xerxes. It is said Alexander the Great, King of Macedonia in the third century B.C., used divers in naval operations in the Mediterranean and, himself, descended in a diving bell to view their work.

An air supply was of concern from the beginning. The earliest divers drew air from a tube that was held at the surface by a float. They must have learned quick-

ly the limitations of this practice, for the pressure underwater makes it impossible to draw air from a surface tube below about three feet. It soon became apparent that air had to be pressurized to the depth of the diver.

The limitations of the diving bell in those times were obvious. There was a

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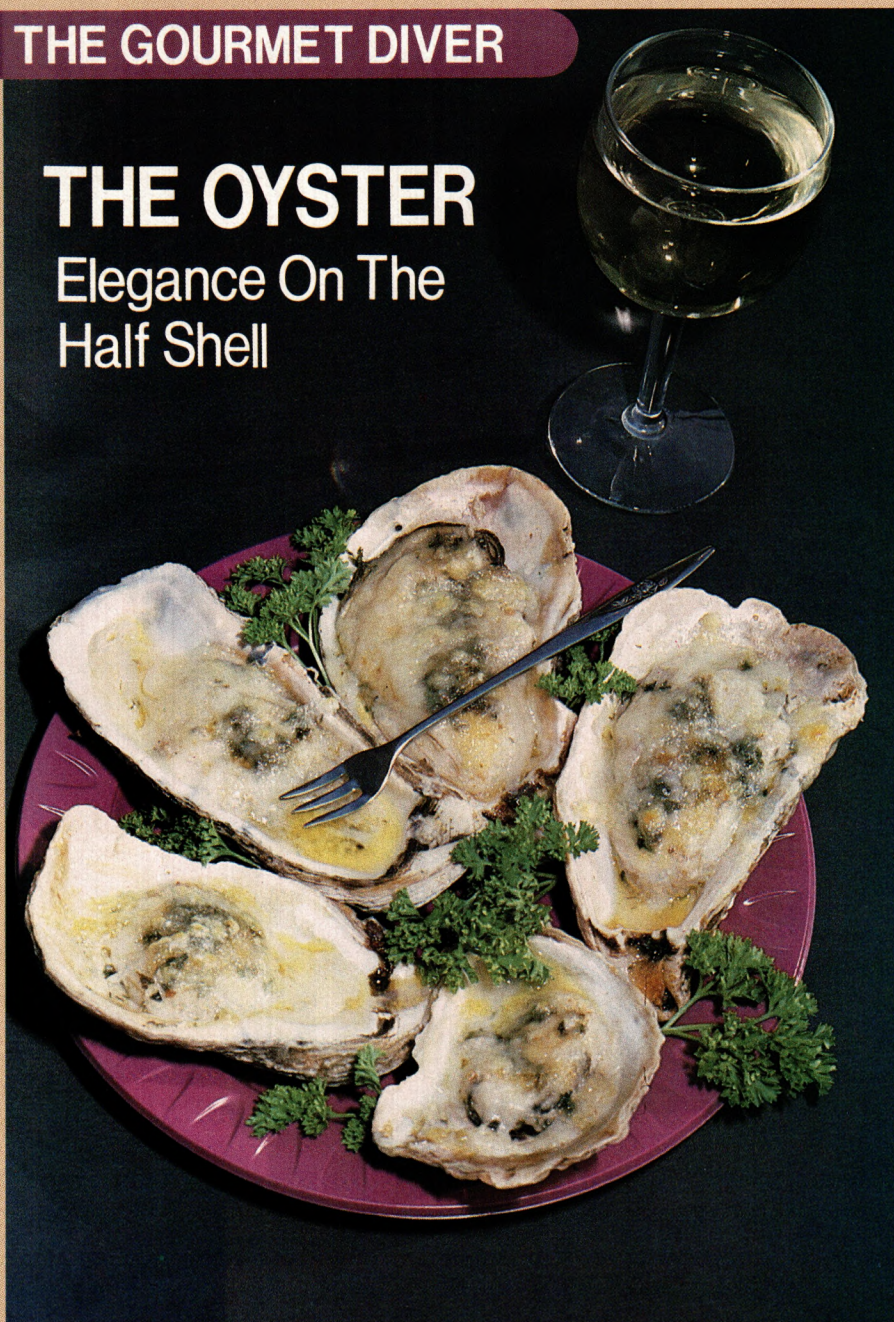
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THE OYSTER

Elegance On The Half Shell



photo/Bonnie J. Cardone
photo/Ellsworth Boyd



Top: Broiled Oysters Fines Herbes. Oysters can be found in inlets such as Chesapeake Bay, where the water is quiet and the climate mild. **Above: Oyster divers display the results of their efforts.**

BY JOHN HILL

What do sport divers do between trips to the more exotic dive spots in the world? Those who truly love the sport and wish to keep active adapt to their environment. Often, this entails diving under adverse conditions such as extreme cold and poor visibility. For example, it has been said: "If you can dive in the North Atlantic region of the United States, you can dive anywhere!"

For many divers in the Chesapeake Bay area of Maryland, oyster diving in the months with an "r" in them has become increasingly popular. The oyster is a small sea animal with a soft body inside a hard, two piece shell. Oysters live on the bottom, usually in inlets where the water is quiet. They can be found in many parts of the world that have a warm or mild climate. They are members of the mollusk family along with clams, scallops and other shellfish.

The history of the oyster can be traced back thousands of years. Fishermen of ancient Rome raised oysters on "farms" along the Italian coast. Oysters have been harvested for food for hundreds of years. Several hundred million tons of oysters are produced annually in the United States. About half of them are harvested on farms along the Atlantic coast.

Each oyster produces about 500 million eggs each year and its life span is roughly six years. The eggs are sprayed into the water and hatch into spat about ten hours later. Shells begin to form in about 24 hours. The next two weeks of their lives are spent swimming and floating in search of hard objects—such as rocks or other oysters—to which they attach themselves.

In the past, oysters have been an abundant food source. However, in recent years, over harvest, pollution and disease have reduced the numbers of this once plentiful shellfish.

Many states have enacted laws to ensure that oysters are protected. In Maryland, for example, you can only dive for oysters on Saturday, you can only harvest one bushel per person and each oyster must be at least four inches long. Many oyster beds are either privately owned or state controlled.

Since watermen are forced by law to tong or dredge for oysters, and depend on them for a livelihood, they are often resentful of divers, who can gather them with relative ease. Most divers, therefore, work the outer fringes of an oyster bed and gather the ones that are scattered and usually not taken by the watermen.

To find the oysters, a piece of chain about four feet long is tied to the end of a rope. The chain is dragged along the bottom of the ocean until the oysters are felt. Then, the anchor is dropped and the fun begins!

Divers in full wetsuits descend into wa-

(Continued on Page 38)

SUN-DRENCHED YELLOWS

As the clouds moved in and opened up again, all the people on the street dashed for cover. Except this one kid. The minute the deluge started, she came running out of her house, as if the storm was a great big party, just for her.

It's for shots like this that I always keep my cameras loaded with Kodacolor VR-G 100, the new film from Kodak.

There was quite a bit of sun coming through, but I wanted to keep the lens as wide open as possible to soften the background and really let the subject pop. I had to make a choice, fast, and do it without precise objective metering. I set up at f/4 at a 500th, and fired away.

I've found that I can get great results within a total exposure latitude of five stops. So I



KODACOLOR AND VR-G ARE TRADEMARKS. © EASTMAN KODAK COMPANY, 1986.



knew I could hold all the brilliant color in the little girl's slicker and the subtle shades in the background shadows, too.

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THE TUSA BCJ-717

Great Looks
Great Performance

TEXT AND PHOTOGRAPHY
BY BONNIE J. CARDONE

"A thing of beauty is a joy forever." While beautiful may not be quite the right word to describe a buoyancy compensator, the Tusa BCJ-717 is extremely attractive. Since the photo that illustrates this article is black and white, you'll have to view this BC in person to see just how good looking it is. The main color is bright yellow, with bright blue at the shoulders and inside. Silver stripes with blue and red piping add nice accents. The pockets are finished with navy seam tape and navy piping adorns the front opening and arm holes. And yes, for those skeptics who believe, "Pretty is as pretty does," the 717 is a fully functional BC. It will do all the things you need it to do and do them very well.

The 717's outer bag is a heavy duty nylon, coated with Hypalon. It's a tough material that is smooth and silky to the touch. The inner bladder is sonically welded PVC. There are three ways to adjust the jacket so it fits you: Two quick-release buckles and a Velcro® closing cummerbund. One of the 717's innovations is its built-in shoulder pads. These distribute the weight of the tank, making wearing it topside more comfortable.

The Tusa comes with a power inflator (with corrosion resistant plastic buttons), a whistle and a detachable CO₂ cartridge. This latter deserves special mention: It unscrews and there is a cap that screws on in its place. Some experts believe the advent of power inflators has made these


cartridges obsolete. I agree. They have a tendency to rust, becoming inoperable. I prefer BCs without them.

The 717 has an overpressure relief valve on the left shoulder that also functions as a rapid exhaust valve when you pull down on the corrugated hose. The two large, Velcro closing pockets on either side of the jacket have mesh panels on the bottom to allow water to drain.

Among the 717's new-this-year features is its backpack. This has a molded support plate with two rubber insets that should help prevent tank slippage. The soft tank band has a rubber sleeve for the same reason.

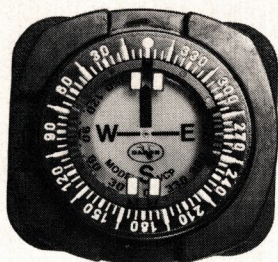
Besides the CO₂ cartridge the only other part of the BC that needs special attention is the inner bladder. Salt crystals can cause punctures in it, but these are easy to avoid. Simply rinse the BC with fresh water after use. Tabata has made this hassle-free: Both the rapid exhaust valve on the left shoulder and the CO₂ cartridge (or cap) screw off, providing great rinsing and draining ports.

The Tusa 717 jacket has one accessory D-ring, a guide for the power inflator hose and a Velcro tab to hold the corrugated hose in place. It comes in five sizes, from XXS to L. The extra extra small should fit even the tiniest diver.

The Tusa BCJ-717 sells for \$320. Try it on for yourself at your nearby Tabata dealer. It's a stylish beauty that works as good as it looks. 

The Tusa BCJ-717 is an attractive piece of equipment that performs all the functions expected of buoyancy compensators. Its main color is bright yellow and it has a CO₂ cartridge that can be replaced with a screw-on cap. The backpack (below) has a molded support plate with two rubber insets to help prevent tank slippage. The tank band has a rubber sleeve.





Dacor has recently introduced a dive instrument console that makes diving so easy, you wonder why any diver would go into the water without one. The

Hi-Tech Console is a child born out of the high technology age of microprocessors and liquid crystal displays. Its father is of hardy analog stock and its mother has a refined, precision digital heritage.

Drawing from the best of both worlds, Dacor has molded a sophisticated, multi-function instrument into a compact, rugged rubber casting. It can withstand some pretty good bumps and swivels 360 degrees on the tank pressure hose.

The Hi-Tech Console packs more diver information readouts into a smaller space than any previous console offered by Dacor. It's like putting the whole dashboard of your car into the palm of your hand!

A total of eight different dive functions are placed at the diver's fingertips. Starting from the top, here is what the Hi-Tech gives you:

Depth Gauge—A highly accurate analog depth gauge reading from 0 to 250 feet. Accuracy at the 100 foot level is within plus or minus 1.6 feet. This gauge features a luminous dial face and color coded depth zones.

Max Depth Indicator—Installed in the same depth gauge dial face is a maximum depth indicator needle that automatically pegs the deepest depth reached on a dive.

Pressure Gauge—An extremely reliable Bourdon tube pressure gauge with an analog dial face. Also luminous, this

gauge accurately measures tank pressures from zero to 4,500 psi.

Thermometer—In the dial face of the pressure gauge, an analog thermometer accurately measures water temperatures from 15 to 130°F. Accuracy is within plus or minus 2°F.

Dive Counter—In the same dial face, a small digital window indicates how many repetitive dives have been made. It can count up to nine dives in one day.

Bottom Time Indicator—In a separate display window, there is a digital LCD display of the total bottom time spent deeper than seven feet. This indicates hours and minutes in standard clock format, up to nine hours and 59 minutes per dive. The bottom time display automatically clears itself and resets to zero at the beginning of the next dive.

Surface Time Interval Indicator—Just above the bottom time indicator is a display of total hours and minutes spent on the surface. This automatically begins tracking time upon reaching five feet. This display also clears itself and resets to zero at the beginning of the next dive.

Compass—An optional underwater compass can be added to the console, sliding onto a special module mount at the base. It features a fully luminous dial, side window display, ratchet bezel and gun sight type sighting lugs.

Five of the console's functions are analog for clarity, quick reading and better planning. The dial faces glow beautifully in dim light and the numbered scales pop out from the background almost as if they were 3-D.

Three functions are electronic and digital with very well designed LCD readout windows. The dive counter is separated from surface interval and bottom time indicators, so there is no confusion.

Digital functions are powered by an amazing three volt lithium cell. It has a shelf life of five years and will provide 6,600 hours of running time. According to the manufacturer, the console could run 24 hours a day for 275 consecutive days before requiring a battery replacement.


The Hi-Tech is the only console with a thermometer. At first I thought this feature was irrelevant, but I found myself checking the water temperature on every dive.

All eight functions are automatic. There are no buttons or switches to manipulate. The electronic timers and indicators are turned on by water pressure (five to seven foot depth) and automatically turn off 12 hours after the last dive of the day. The only function that requires attention is the reset screw for the max depth needle and that is turned back after the dive.

You don't have to buy the underwater compass, it is an optional choice. The console is 30 percent smaller without it.

We tested the Hi-Tech Console by taking it for a couple plane rides to the Caribbean and then diving the heck out of it for two weeks. Averaging three dives daily, we tried everything from wall dives, to coral cave crawling, to shipwreck penetrations and night dives. The console performed flawlessly!

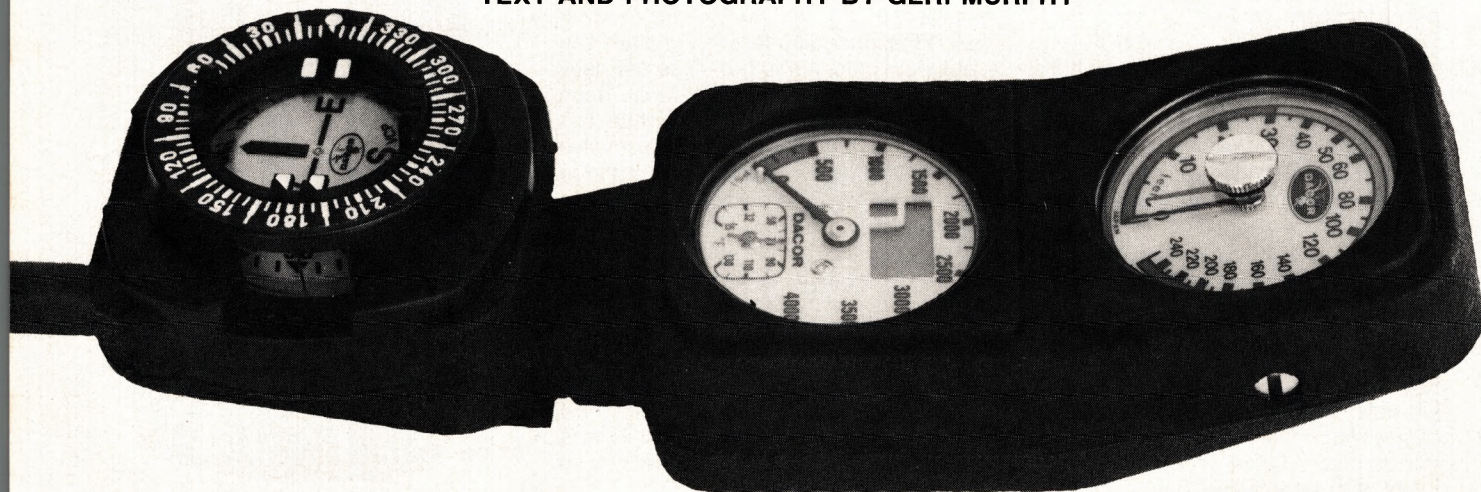
At the risk of alienating Dacor equipment fans, I would say the Hi-Tech Console makes any prior instrumentation obsolete. Whether you are a new diver or an old moss back, the Hi-Tech should be on your "must buy" shopping list.

The 3357-00 console that illustrates this article (with compass) sells for \$280. It is also available in metric for the same price. For more information, see your local Dacor dealer or contract: Dacor Corporation, 161 Northfield Road, Northfield, IL 60093; (312) 446-9555. 

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TEXT AND PHOTOGRAPHY BY GERI MURPHY





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SDM's U/W Photo Class

How To Use Simple Cameras

TEXT AND PHOTOGRAPHY BY JIM AND CATHY CHURCH

You can take fun U/W snapshots or color slides without having to learn a bunch of facts and figures and without being burdened with bulky, expensive equipment. If you can use a "point and shoot" camera topside, you can use it underwater as well.

DO IT WITH A DISC

A housed disc camera, with automatic film advance, automatic exposure control and built-in flash, can get you started quickly and inexpensively. While you can look through the built-in viewfinder of the camera, a larger plastic accessory viewfinder attached to the top of the housing is easier to use. The basic picture taking steps are:

1. Load the camera and close the underwater housing.
2. Select a subject about two to five feet away.
3. Aim the camera at the subject.
4. Squeeze the shutter release to take the picture.

If the light is too dim for a sunlight exposure, the built-in flash will go off. If the water is dirty, however, the light from the flash will strike suspended particles in the water and these will appear as little bright spots (called backscatter) in the picture.

HOUSING A 110 CAMERA

You can house most 110 pocket cameras in an Ikelite Trimcase. If your camera doesn't focus closer than about five feet, order the water correcting lens (#5304) with the Trimcase. It brings the focus down to the two to five foot distance at which you will be taking most of your U/W pictures. Once the camera is in the housing, the basic picture taking steps are the same as with disc cameras.

AMPHIBIOUS 110 CAMERAS

Amphibious 110 cameras—such as the Hanimex Amphibian 110 MF, Minolta Weathermatic-A and the Sea & Sea Pocket-Marine 110SE—can be used topside or underwater. The Hanimex and Pocket-Marine feature built-in flash, automatic film advance and a simplified exposure control system. The exposure control lever has three positions: sunny, cloudy and flash. If you anticipate dim lighting conditions, use ISO 400 film. If you anticipate bright conditions, use ISO



Above, left to right: The Nikon One-Touch 35mm autofocus camera fits in the Helix Auto Marine Housing (not shown); the Sea & Sea Motormarine 35mm camera with optional baseplate and handle for attaching accessory flash units; the Hanimex Amphibian 110 with optional close-up lens. Below left: The Canon Aqua Snappy with close-up system. Below right: The Aqua Snappy with sports finder.



photos/Geni Murphy

100. The steps for using either camera are as follows:

1. Load the camera with film, close the back and start with the exposure control set for sunny.
2. Aim the camera at a subject about three to five feet away.
3. Look in the viewfinder and depress the shutter release part way. If the red warning light is glowing, reset the exposure control for the cloudy position. If the light still glows, reset for the flash.

4. Depress the shutter release all the way to take the picture.

You can also photograph subjects such as tiny hermit crabs and flamingo tongues with easy to use close-up lenses. For the best lighting, Sea & Sea recommends its compact YS-20 flash unit. Here's how to take close-ups:

1. Load with ISO 100 film and attach the close-up lens and YS-20 flash unit.
2. Set the exposure control for sunny (the aperture will be f/16 and the built-in



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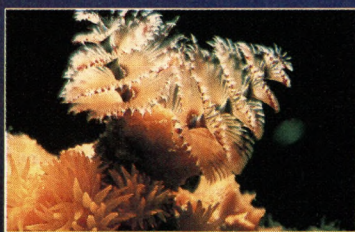
That's because the camera itself controls the flash, reading the light that falls on the film plane and shutting off the flash at the moment of optimum exposure. You get great pictures every time. Just focus and shoot.



Manual Shutter Speed Control

With a full range of manual shutter speeds at your command, you have the ability to make the exposure *you* want. You can compensate for backlighting, overcome difficult conditions, take advantage of unusual situations.

Example: This shot made at 1/60 sec., f8 and top lighting with the SB102 at manual 1/4 power. Creative control is in your hands.



Large Built-in Viewfinder

The answer to divers' prayers—a viewfinder big enough to really work underwater. Bright LED display shows you what the camera is doing in every situation. And to make sure you get what you see, there's an incredibly accurate light meter built-in, the most accurate ever designed for underwater use.



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flash won't fire).

3. Place the tip of the aiming wand just beneath the 2 x 3 inch picture area.

4. Hold the YS-20 flash one foot from the subject.

5. Take the picture.

Note: Any other strobe with a Nelson or Sea Loc connector, such as the Ikelite Substrobe #4038.8, can also be used. The flash to subject distance will be about 18 inches with ISO 100 film.

SIMPLE 35MM AMPHIBIOUS CAMERAS

Although the Sea & Sea Motormarine 35 and Hanimex Amphibian 35 have the same outward appearance, they are different cameras. Both feature automatic film advance, a built-in exposure meter, an aperture range from f/2.8 to f/16 and focus adjustment from one meter to infinity. However, the Sea & Sea Motormarine's shutter speed is fixed at 1/100 second, while the Hanimex's shutter can vary from 1/60 second at f/2.8 to 1/500 second at f/16. The Motormarine's built-in flash positions are f/2.8 and f/4; the Hanimex's are f/2.8 and f/5.6. A 24mm wide angle adapter, close-up lenses and the YS-20 strobe are available from Sea & Sea for the Motormarine.

Here are the basic steps for using either the Motormarine or Hanimex:

1. Load the film and set the switch for the speed you will be using (ISO 100, 200 or 400).

2. Start with the exposure control set for f/16.

3. Aim the camera at an U/W subject about four or five feet away and set the focus for that distance.

4. Look to the left of the viewfinder. If the red light (underexposure warning) is glowing, move the exposure control lever upward until it goes out and you see only a green light (correct exposure indicator).

5. Take the picture.

Note: If you see a red light (overexposure warning) to the right of the green light, move the lever downward until it turns off. Otherwise, sunlight will overexpose the picture. This may happen in bright water if you set the exposure control lever upward for one of the flash positions and is most likely to happen if you use ISO 400 film.

At this writing, the Hanimex U/W flash instructions are incorrect. When using flash, set the exposure control lever for the f/5.6 flash position, not f/2.8! As a rule of thumb, have both levers (aperture and focus) turned all the way up (for f/5.6 and one meter) when using flash and ISO 100 film.

The Sea & Sea YS-20 flash has two advantages over the built-in Motormarine 35 flash: Because it can be moved farther away from the camera lens, you won't have as many illuminated particles in your pictures. Also, you can use the flash at any exposure setting. Here's how to use the YS-20, or any other strobe that can be attached to the camera with a connector cord:

1. Make a table that shows flash exposures for flash to subject distances of three to six feet. Attach this to your camera or strobe (laundry marker on white tape works well).

2. In bright conditions, adjust the aperture for a sunlight exposure (the green light glows).

3. Compare the f/stop in the exposure control to the f/stop on the table for the flash to subject distance being used.

4. Set the lens for the highest numbered stop.

If the sunlight f/stop (determined with the green light) was higher, you will have a sunlight exposure with a soft flash lighting to enhance color and detail. If the f/stop on the exposure table was higher, you will have flash exposure with a darkened sunlit background. It's OK to take the flash picture with the underexposure red warning light glowing. The strobe makes the correct exposure without telling the camera.

The Canon Aqua Snappy AS-6 can be used to 33 feet. It has a prefocused 35mm lens, automatic film advance, automatic exposure control and built-in electronic flash. The auto exposure range is from f/4.5 at 1/40 second to f/11 at 1/250 second. The basic steps for using the Aqua Snappy are as follows:

1. Load the film. (For dim U/W conditions, use ISO 400 color print film or ISO 200 slide film.)

2. Aim the camera at an U/W subject about four or more feet away.

3. Look into the viewfinder and depress the shutter release halfway. If you see a blinking red light, turn on the flash.

4. Take the picture.

For close-ups of postcard sized sub-

jects, load with ISO 100 film, attach the accessory close-up lens to the camera and follow these steps:

1. Underwater, flood the space between the close-up lens and the regular camera lens.

2. For colorful pictures, turn on the built-in flash.

3. Place the tip of the aiming wand slightly more than an inch (slightly less than two finger widths) beneath the desired picture area.

4. Take the picture.

Note: If the flash overexposes, tape a piece of white, translucent plastic over the reflector.

HOUSING A 35MM AF CAMERA

Helix offers the Auto Marine Housing for the simplified 35mm cameras, such as the Nikon One-Touch, that feature both automatic exposure control and AF (autofocus) for true point and shoot operation. Autofocus using optical systems will work inside camera housings, but sonic and infrared systems won't.

FOR MORE INFORMATION

If you decide to house a disc or 110 camera, you should read *Disc Underwater Photography* (#3105) or *Underwater Photography With 110 Pocket Cameras* (#3110). These books, by Gale Livers, are \$6.95 each from Ikelite. For their U/W photo catalogue, send \$1 to Ikelite, P.O. Box 88100, Indianapolis, IN 46208. For more information about Sea & Sea cameras and accessories, write to Sea & Sea, USA, 1030 West 15th Street, Riviera Beach, FL 33404. For more information about Hanimex and Helix Auto Marine Housings, write to Helix at its new address, 310 S. Racine St., Chicago, IL 60607. For more information about the Aqua Snappy AS-6, write to: Canon USA, One Canon Plaza, Lake Success, NY 11042.

ESTIMATED FLASH EXPOSURE TABLE FOR THE SEA & SEA YS-20

Flash to subject*	ISO 100	ISO 200	ISO 400
1 ft.	f/16	—	—
2 ft.	f/8	f/11	f/16
3 ft.	f/5.6	f/8	f/11
4 ft.	f/4	f/5.6	f/8
6 ft.	f/2.8	f/4	f/5.6

*The flash to subject distance is the apparent distance as your eye sees it. The camera to subject distance doesn't matter.

IKELITE SUBSTROBE S

The Substrobe S can be used with Disc and housed 110 cameras. It isn't connected to the camera with a cord; the Substrobe S is triggered by a slave sensor. It works as follows: A reflector is attached to either a Disc or Trimline case or over the reflector of a Sea & Sea or Hanimex 110 or 35mm camera. The reflector blocks the light from the camera's built-in flash and directs it to the sensor on the side of the Substrobe S. When this sensor "sees" a flash of light, it triggers the Substrobe S.



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WRECK FACTS

(Continued from Page 14)

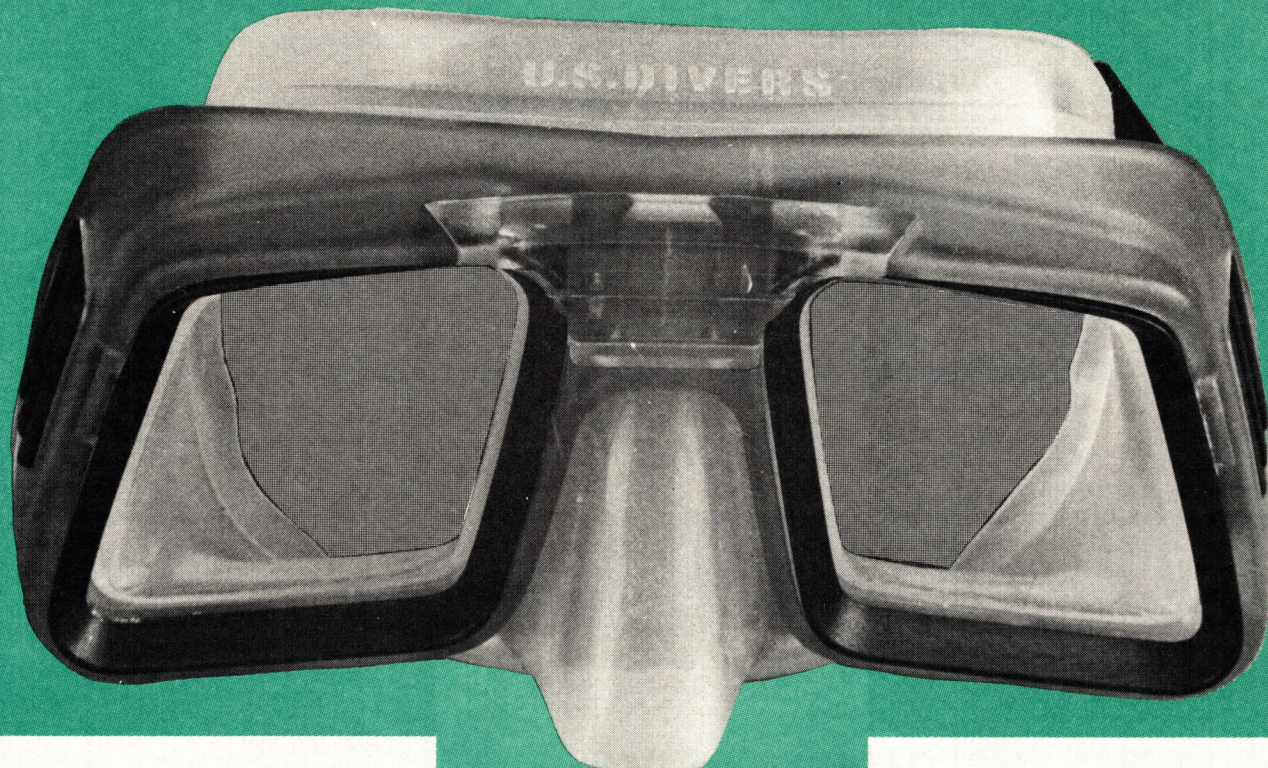
heard of Vince, but perhaps the readers can help. If so, contact Vince at 78-09 Park Drive East-A, Flushing, NY 11367. Vince is the divemaster on the *Lady Luck* out of Sheepshead Bay, Brooklyn, New York. He says diver Bob Wasserman retrieved a beautiful brass porthole from the wreck of the *Black Warrior*. Other divers brought up silverware and various artifacts from the old steamer that was stranded off Rockaway Beach in 1858.

Thanks to Isle Royale National Park naturalist Bruce Webber for telling us about a new book, *Above and Below—The History of Lighthouse and Shipwrecks of Isle Royale*, by Thom Holden. Ten wrecks are covered in this 65 page paperback, including one of my favorites, the *Algoma*. Isle Royale shipwreck history goes back to 1840 when the American Fur Company schooner, *Siskawit*, wrecked near its fishing and trapping station. Other wrecks in the area include passenger steamers and package and bulk freighters. *Above and Below* may be ordered, postpaid, for \$5.95 by writing to the Isle Royale Natural History Association, 87 N. Ripley Street, Houghton, Michigan 49931.

"Just what the doctor ordered," is the best way to describe the new three-in-one charts: *Snorklers' and Divers' Guide to Old Shipwrecks of Florida's Southeast Coast*. Thanks to author and adventurer Bob Burgess for telling me about them. I have received many letters from divers asking for "all the information you have about treasure ships wrecked off the Florida coast." Now I can refer them to these charts, two on one side and one on the other of 20 by 28 inch buff colored paper, suitable for framing as well as functional use. The charts include compass bearings and cross ranges for more than 50 wrecks, including the Spanish treasure fleets of 1715 and 1733. Old wrecks from below Cape Canaveral to the upper Florida Keys are pinpointed, including locations, condition and brief histories. The three-in-one shipwreck charts may be ordered from: Spyglass Publications, P.O. Box 485, Chattahoochee, FL 32324; the price is \$15.95, including postage.

Safe diving to us all. Be sure to include a stamped, self-addressed envelope when writing: Ellsworth Boyd, 1120 Bernoudy Rd., White Hall, MD 21161.

**IF YOU DIVE
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skin diver magazine



When my brother Dan made his first few ocean dives with me I thought he overdid the buddy diving bit. I never had to worry about losing him; he was always on my heels—literally! The reason for this was soon revealed. Dan was blind as a bat without his glasses. Wearing an ordinary facemask, he had to stay within touching distance of me or be lost, both underwater and on the surface. He was thrilled when I got him a prescription mask, wearing it joyfully as he got ready for a dive, underwater and afterward, while removing his gear, as well. It was the first thing he put on and the last thing he took off. Being able to see well meant a great deal to him. And, I swam a lot better without him on my heels!

USD DELTA OPTICAL MASK

You Too, Can See
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TEXT AND PHOTOGRAPHY
BY BONNIE J. CARDONE


The low volume, silicone Delta comes with tempered glass lenses that can be replaced with prescription ground lenses in diopters ranging from -1.5 to -7.0. Part of the mask above the nose pocket slides out. This holds the black lens retainers in place.



If seeing better would make you a more independent, confident and happier diver, take a good look at U.S. Divers Delta optical mask. One of the neat things about it is that if you like how it feels and fits, a salesperson can install the lenses while you wait and you can take it home with you. The specially ground, tempered glass lenses are available in diopters ranging from -1.5 to -7.0, in .5 increments. Since each lens is separate, it is easy to accommodate those who need a different prescription for each eye. USD dealers have a special frame that allows you to try the lenses on before you buy to make sure they are right for you.

A very low volume, modern mask, the Delta is easy to clear and produces little or no drag. A nose pocket allows easy equalization. The skirt is soft, crystal clear silicone with a feather edged seal. There is a split head strap for comfort and security. The strap is attached to the mask via insets in the frame. To shorten or lengthen the strap, pop the insets out, make your adjustments, then pop them back into the frame. The strap ends are secured with special retainers.

Non optical tempered glass lenses come with the Delta. The optical lenses are optional. Part of the mask's frame, just above the nose pocket, slides off, allowing you to remove the black lens retainers. When these are out, the lenses can be removed or installed easily.

The Delta comes with a blue, red, gray or black frame and sells for \$39. The optional optical lenses are \$22 each. Try a Delta on at your nearest U.S. Divers dealer. There's a beautiful underwater world out there and believe me, you'll enjoy diving more when you can see it clearly. Right Dan? 

Diving News From Down Under

Lizard Island Gets A New Dive Boat

BY GERI MURPHY

Lizard Island, Australia's northernmost island resort, has finished construction of a brand new 18 passenger dive boat. The craft is designed specifically to carry guests from Lizard to the best dive sites along the outer edge of the Great Barrier Reef.

Sixteen miles from the mainland and 150 miles north of Cairns, Lizard Island is an unspoiled national park covering 2,500 acres of mountainous terrain. It is ringed by more than two dozen pure white sand beaches and adjacent coral reefs. Lizard is inhabited by a colony of large but harmless iguanas, plus a variety of tropical birds and other small wildlife. The only evidence of a human population is a small 32 room hotel and an adjoining airport runway.

Named the *Volare*, Lizard Island's new dive boat is a 46 foot custom built aluminum craft powered by twin 250 hp Man diesels. This high speed vessel cruises at 17 and can achieve a top speed of 20 knots. It is equipped with an extra large, surface level platform and a full width ladder for easy scuba entry and exit.

The new boat will operate within a 15 mile radius of Lizard Island, bringing divers to some of the most spectacular sites along the outer Great Barrier Reef. One of the most popular is the world famous Cod Hole, a coral reef pass inhabited by a family of 11 giant potato cod (black and white groupers).

Other well known dives include Fish Markets, an exciting site adjacent to Cod Hole and popular for the immense number of pelagic fish that congregate on the outer point of the reef. Night dives are conducted at Bank's Bank and a number of other sites inside the edge of the Great Barrier Reef.

The diving season at Lizard Island is somewhat longer than that for Australia's Coral Sea trips. September through January is the prime season, with cloudless blue skies and calm water. February through April is the beginning of the rainy season but can often offer some of the best diving to be found here. The weather at this time of the year can be unpredictable. May through August is a period of consistent southeast trade winds averaging 15 knots. Because of the wind factor,



Above: Tony Carroll, Lizard Island dive-master. Top: The new dive boat *Volare*.




visibility is reduced to 60 feet, but the area is still divisible. Water temperatures in the Lizard Island region of the Great Barrier Reef range from 74°F in May to 86°F in December.

Lizard Island Resort is a simple but luxurious retreat from the pressures of everyday life. It accommodates up to 64 guests, who pretty much have the run of the entire island. There are no crowds, no traffic jams (no cars) and no difficulty in obtaining prompt and personalized service. The island is without television and telephone, although urgent messages can be transmitted by radio. All rooms are private suites with shower, bath, mini bar, king/queen sized beds, private porches, writing desk and intercom facilities. There is a freshwater swimming pool behind the rooms and a beautiful beach

and quiet cove right out front.

Guests can order a specially prepared picnic basket for a beach outing. The hotel provides skiffs with small outboard motors for cruising to secluded beaches. The hotel also provides a variety of water-sport services including water skiing, catamaran sailing, windsurfing and glass bottom boat trips. The resort has a new tennis court for both day and night matches. Other activities include archery, light game fishing year-round and marlin fishing from October through November. There is a full service dive shop on the property and a learn to dive program is conducted weekly.

For information contact Dive In Australia, 50 Francisco St., Suite 205, San Francisco, CA 94133; (415) 928-4480. 

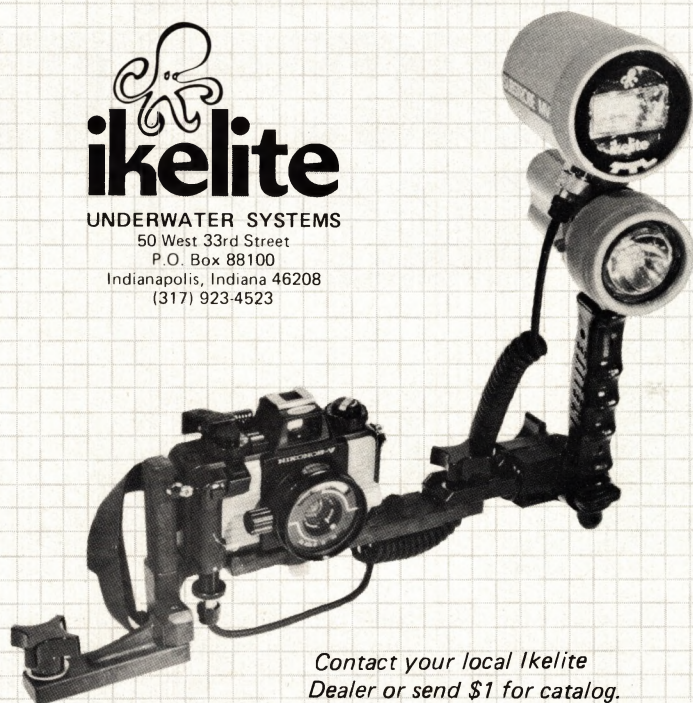
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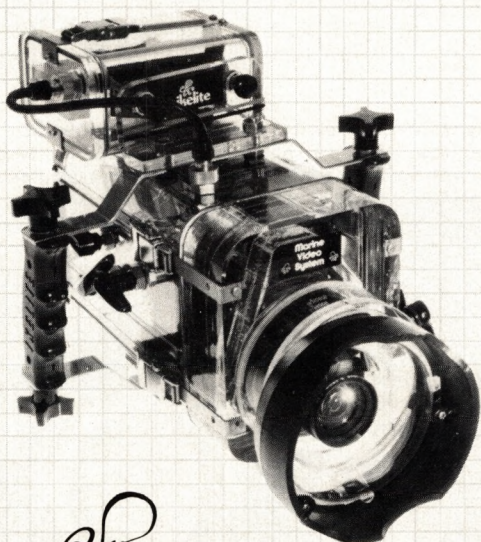
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Ikelite also offers a custom installation service for cameras and recorders not listed.
For additional information contact Ikelite or your Local Ikelite Dealer.

HEUER EXECUTIVE WATCH

Ultra-Thin,
Ultra-Classy

BY JIM WALKER

photo/Bonnie J. Cardone

I should have worn the black version. Instead, I wore the champagne model of the Heuer Executive Watch—and took a lot of ribbing about it. “No it isn’t a dress watch pretending to be a dive watch,” I’d reply. “It works.” My detractors were skeptical. What diver wouldn’t be skeptical of a watch that looks as if it was purchased on Rodeo Drive; and one that’s so thin!

But, the Heuer Executive didn’t leak, didn’t stop and didn’t even get a scratch while worn outside my wetsuit sleeve on several dives. And, despite the elegant design of the watch face (i.e. small markings) it was easy to read underwater.


The Heuer Executive Watch is actually a series of nine models. Three sizes are offered: a large chronograph, a men’s sports watch and a women’s sports watch. I tested the men’s sports watch, the intermediate sized model. In each size you have a choice of brushed stainless finish with gold accents and champagne face, gold finish with black accents and black face, or black finish with gold accents and champagne face. All styles have matching bracelets. The bracelets come with removable links for length adjustment—nine in the women’s sports watch and 11 in the men’s sports watch and chronograph. The bracelet clasp incorporates a snap-in projection to help keep it closed.

The Executive Watches are ultra-thin; the men’s sports watch measures only one-quarter inch. It features a thin body, topped by an extremely thin bezel set flush with the sapphire glass crystal. The one way ratcheted bezel has minute scalloping around the edge. Surprisingly, this can be gripped with relative ease, even by gloved fingertips. The bezel has markings

around its circumference from 0-60 minutes. On the model I tested these markings were gold on a dark gray background. Because these might be hard to read in very dim light, the portion of the bezel corresponding to 0-15 minutes is coated with luminous tritium. All the hour positions on the face and the hands have tritium sections. Thus, in dim light or darkness, the relationship of hands to hour positions to bezel will tell you at a glance what your dive time is. The bezel is covered with inlaid mineral glass to protect it from scratching.

A date window is on the face at the

three o’clock position. It and the hands are set by the screwdown crown. All Executives are depth rated to 660 feet and they are quartz-electric. However, the chronographs are also available in automatic (self winding).

The Executives range in price from \$700 for the men’s and ladies sports watches in brushed stainless, to \$1100 for the chronograph in gold finish. If you’re after a classy watch that looks more at home in the executive suite than on a dive boat, yet performs like a high-tech submersible, check out the Executive Collection at your Heuer dealer. 

Top: The Heuer Executive (men’s sports watch) in brushed stainless with gold accents. Below, left to right: Chronograph in stainless, women’s sports watch in gold with black accents, men’s sports watch in black with gold accents. Nine models are available.



photo/courtesy Heuer

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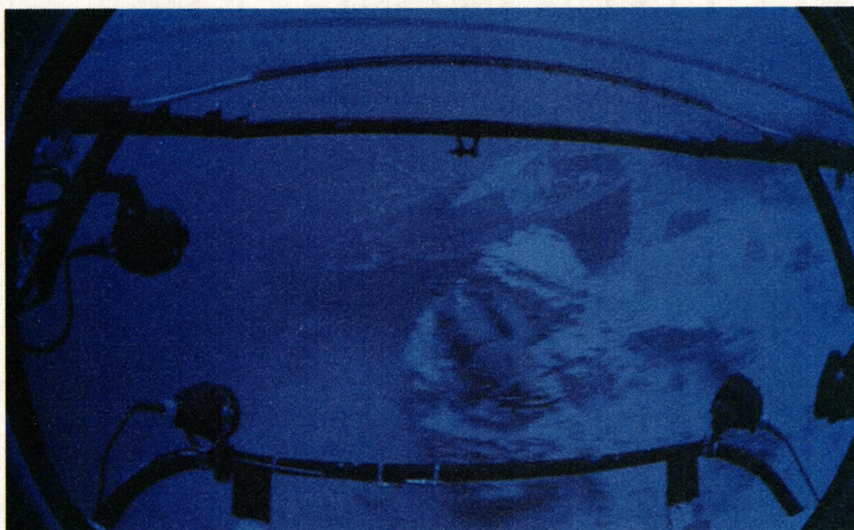
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We saw her faint outline when we reached 600 feet. And, at 700 feet, we could see details. It was a magnificent sight: The entire length of the *Kirk Pride*, an interisland freighter that sank and slid over Cayman's wall. Intact and resting upright at 760 feet, the *Kirk Pride*, viewed through the dome port of the submersible, looked like a child's toy. The sunlight penetrating to this depth reminded us of a clear night with a full moon.

Cathy raised her Nikon for a meter reading. It was too dark for ISO 1600, so she reset the film speed for ISO 4800. It was difficult to focus through the submersible's port and, even with an aperture of $f/3.5$, we could hear the shutter go "clunk, clunk" during the long shutter speeds of $1/4$ and $1/15$

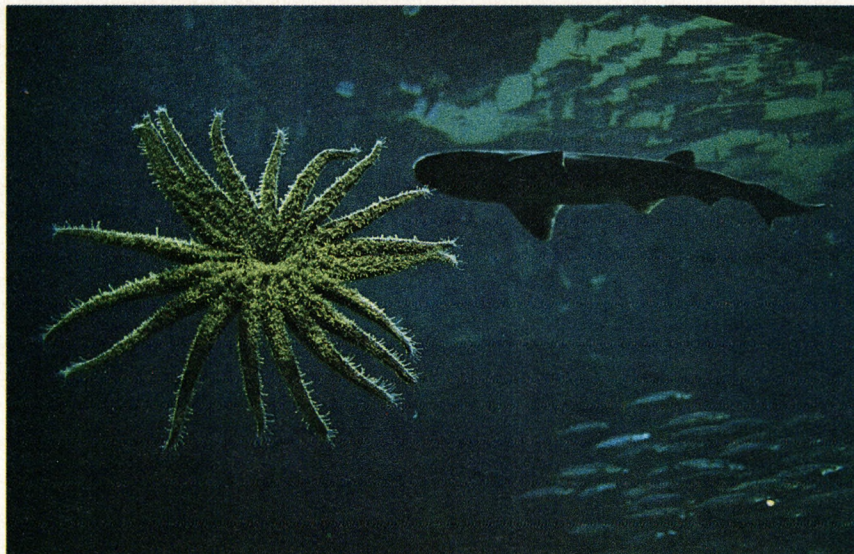
Fujichrome P1600

A Professional Color Slide Film Designed For Push Processing



Left: Fuji P1600 can be exposed at (and push processed for) speeds as high as ISO 4800. **Top:** The *Kirk Pride*. This was a sunlight exposure at $f/2.8$, $1/4$ second, ISO 4800, taken with a 16mm full frame fish-eye lens. **Below:** A starfish climbs the viewport at the Monterey Bay Aquarium—photo exposed at $f/2.8$, $1/30$ second, ISO 1600, using a Nikon 24mm lens.

TEXT AND PHOTOGRAPHY BY JIM AND CATHY CHURCH



second. The results were impressive: Cathy's slides show an entire ship photographed at 760 feet with natural light. Although the wide apertures and slow shutter speeds yielded images without the sharpness and contrast for quality magazine reproduction, the slides are exciting when projected.

The reason for taking these natural light pictures below 700 feet was to test Fujichrome P1600 professional color slide film. The "P" in P1600 means it is designed for push processing. This means you can expose it at a higher speed and then extend the processing time in the first developer. Thus, Fujichrome P1600 is a variable-speed film. You can expose it at ISO 800, 1600, 3200 and even 4800. You mark the cassette for the speed you used and the film is processed for that speed. If you expose at ISO 4800 and opt for commercial processing, mark "P-4 16 min., 30 sec." on the cartridge or the processing order sheet. The development times are noted on the cassette for each speed should you decide to home process the film with standard E-6 chemicals. For best results, Fuji Photo Film Company recommends that P1600 be exposed and processed for ISO 1600 or 3200. At ISO 4800, Fuji recommends you make some test exposures and evaluate the results.

The designation "Professional D" means that P1600 is designed for pro-

fessional photographers. To enhance reproduction in books and magazines, scanner color separation requirements for color printing were considered when the color dyes, gradation balance and other specifications were determined. To obtain an ultra-fast film speed without undue sacrifices in sharpness, grain and color reproduction, Fuji has developed advanced emulsion technologies including their L-Coupler, SSS (Sharp Spectral Sensitization) and DDG (Differentially Developing Grain). To sum it up, Fujichrome P1600 isn't just a regular film that you push process—it is designed specifically for push processing.

We chose the Monterey Bay Aquarium for the first test roll. Because of the overcast sky, the aquarium tanks were darker than normal and we opted to expose at ISO 3200. Exposures varied from f/2 to f/2.8 at shutter speeds of 1/30 to 1/60 second.

Cathy processed the film for the recommended 15 minutes. We had exposed mostly for the shadow areas and these showed details in our slides. The white anemones (as we would expect with any color slide film) were overexposed. We feel that in low light situations, Fujichrome P1600 performs best with a scene having a relatively even brightness range. If there are light subjects (such as white anemones) in the scene, you must expose for these high-light areas to avoid overexposure.

Armed with our last two rolls of Fujichrome P1600, a Nikon F3, a 16mm full frame fish-eye lens and a 35-105mm zoom lens, we squeezed into a small three person deep submersible and headed for Grand Cayman's wall. Cathy started shooting at ISO 1600 during the descent down the side of the wall, but increased to ISO 4800 when the *Kirk Pride* came into view. A second submersible joined us and Cathy photographed it, with the *Kirk Pride* in the background, at both ISO 3200 and 4800. Then, our sub moved in close to three pale, stalked crinoids. Our sub's limited lights did not shine directly onto them, but with ISO 1600 we could use f/5.6 at 1/250 second.

Home in California, we faced a processing dilemma: Because of the changing light conditions and the difficulty of working in the cramped sub, parts of each roll had been exposed at different film speeds. Also, we had just read an article indicating that Fujichrome P1600 generally required longer developing times than specified for the higher speeds. Cathy's solution was to cut a couple of inches of film from the start of

each roll (that were exposed at different film speeds) and to experiment with different development times. This involved some guesswork and we naturally lost some pictures when she cut up the rolls for processing.

Since dark background details of the shipwreck were important in several of our shots, she decided on 19 (rather than the recommended 15 to 16½) minutes in the first developer for exposures bracketed from ISO 3200 to 4800. This extended processing reduced the black areas to a thin gray, but showed surprisingly good background shadow details. However, bright foreground areas were overexposed in some of the shots when our sub's bright light got close to the wreck or the other sub.

For the ISO 1600 exposures, Cathy used 15 minutes rather than the specified 12 minutes. The blacks were much denser and the colors better than the ISO 3200 shots. The backgrounds, however, went black. Thus, we could not see the *Kirk Pride* behind the sub in the foreground.

Since our test was made in such an unusual lighting situation, it is impossible to judge the color balance. However, it appears that the film is remarkably neutral. The yellow submarine was bright, the blue background normal and the red casings of the submersible's lights looked correct. Fujichrome P1600 records sharp images. Thus, although it is grainy (as are all other such fast films), it will record lines with sharp edges. You can even see the separation of the fine lines of the small stalked crinoids. Naturally, with longer processing, graininess increases, color saturation decreases and black loses density.

For U/W photography, Fujichrome P1600 can be used for interior wreck shots, scenic shots beneath a canopy of kelp and silhouettes in turbid water. In these situations, sunlight is often the best light source because it produces a natural appearance.

To give you an idea of how sensitive Fujichrome P1600 is, imagine you are in about 30 feet of clear water. An ISO 1600 exposure would be about f/16 at 1/250 second and an ISO 3200 exposure would be about f/22 at 1/250 second. If you were photographing seals as they dart by, you could set your Nikonos IV-A or V for f/11, to gain depth of field, and A (auto) for a shutter speed of about 1/500 second at ISO 1600.

Being able to decide on a film speed after you are U/W and have metered the scene is a nice feature. Once you decide on a film speed and start taking

pictures, however, you can't change your mind without losing some of your pictures. If you do your own processing, you could shoot half a roll at one speed and the other half at another. Then, you could cut the roll in two (which will probably ruin two shots) and process each half for a different time.


If you use strobe lighting, you will need an exposure chart that shows exposures for the different film speeds. You must use manual exposure control because TTL systems can't handle such a fast film. If you are working in dim conditions, be sure to set your strobe for its lowest power setting. Otherwise, you can overexpose easily. If it only has one setting, tape a couple layers of cloth over the reflector. To give you an idea of the exposure, a strobe that requires f/5.6 at four apparent feet with ISO 100 film would require f/22 with ISO 1600 film.

Fujichrome P1600 can be used for indoor sports, races or any situation where fast shutter speeds are needed to stop action or when small apertures are needed to maximize depth of field. On a sunny day, for example, the basic ISO 1600 exposure is f/16 at 1/1000 second. In open shade, the ISO 1600 exposure is f/11 at 1/500 second.

Fujichrome P1600 is also great for dim light conditions when you can't use an electronic flash. At ISO 1600, you can photograph stage and indoor scenes with apertures ranging from about f/4 to f/5.6 at 1/60 second and evening baseball scenes at f/4 to f/5.6 at 1/125 second.

No exposure corrections or color compensating filters are needed for exposures from 1 to 1/4000 second—the range most photographers use. For longer shutter speeds, use a 2.5G filter and one-half stop more exposure for four seconds; a 5G filter and one stop more exposure for 16 seconds; and a 5G filter and one and two-thirds stops more exposure for 64 seconds.

Fujichrome P1600 Professional D color slide film is available in 35mm 36 exposure cassettes from professional stock houses. For a list of these dealers, write to Professional Products Dept., Fuji Film Inc., 350 Fifth Ave., New York, NY 10001. The suggested retail price is \$11.64 per roll. Processing of Fujichrome P1600 Professional D is not offered by Fuji and processing by independent E-6 labs will vary in price.

For more information about Fujichrome P1600, write directly to: Fuji Photo Film, Ltd., 350 Fifth Avenue, New York, NY 10001. 

YS-150

Fast Charge Strobe



TEXT AND PHOTOGRAPHY BY GERI MURPHY

Manufactured by Sea & Sea, a well known Japanese developer of U/W photo gear, the YS-150 is the top of the line of four strobe models and one of the first introduced. It has been around for years, yet retains the distinction of being one of only two big gun strobes featuring a circular ring-type flash tube.

This unit puts out a powerful flash with a 100 degree angle-of-coverage. The light pattern is perfectly round, which means you can hold the strobe head at any position.

Slightly smaller in size than most rechargeable big strobes, the YS-150 is easy to handle underwater and is equipped with a number of desirable features. It offers two power modes; half power and full power, with one f/stop difference in lighting. The unit has a slave mode that allows remote triggering. The slave is versatile, working on either power mode.

The color temperature of the flash output is 5400°K, making it one of the warmest strobes on the market. This feature is particularly desirable to professionals who are photographing models and need good flesh tones in their pictures.

If the YS-150 has any drawbacks, it would probably be the limited number of

flashes. It uses a small, lightweight rechargeable battery pack that has helped cut down the size and weight of the overall unit. The manufacturer quotes 100 flashes on a fully charged battery, but leaving the ready light on while swimming around the reef tends to drain some of the energy. I'm lucky to squeeze two rolls (72 exposures) of film out of a charge.

Sea & Sea engineers resolved this problem to some degree by making the YS-150 battery pack removable. Custom built by Sanyo of Japan, this tiny 7.2 volt nickel cadmium battery pack is the size of a cigarette pack and fits in the palm of your hand. It only weighs 11.8 ounces. The battery pack can be charged in or out of the strobe.

Because of its compact size, divers can easily carry three or four battery packs along for a full day of flash photography. They are relatively inexpensive at \$56.50 per pack. The only snag here is that it takes 12 hours to fully charge a pack. But wait, Sea & Sea has again come to the rescue.

The exciting new attraction of the YS-150 is the advent of a fast charge battery pack, also produced by Sanyo. This is the same size and weight as the other pack, but will fully charge in 15 minutes



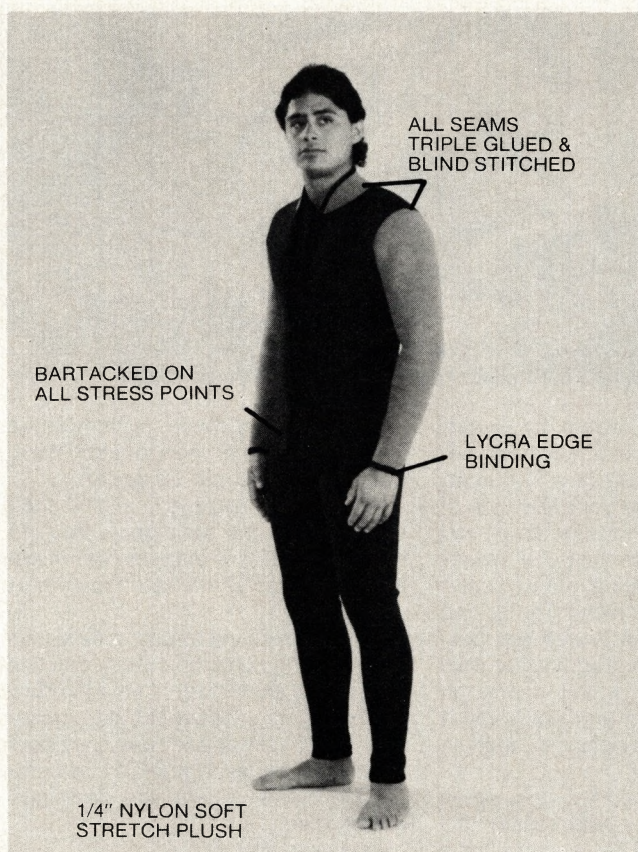
on a 12 volt DC automobile plug charger or 60 minutes on a 110 volt AC wall plug charger. The new fast charge battery will put out up to 70 flashes.

The new fast charge battery is distinguished by a wide red band around the pack itself. It retails for \$66.50.

Sea & Sea is also offering a new battery charger just for the fast charge pack. It sells for \$60.95. It has a built-in charging indicator light and automatically shuts off when the battery is fully charged.

The YS-150 is available with either a Nikonos or Sea Loc (Nelson) flash cord connector. It can also be converted to EO by using a Sea Loc/EO adapter cord.

The YS-150 sells for \$533.95. For more information contact: Sea & Sea USA Inc., 975 West 17th St., Riviera Beach, Florida 33404; telephone (305) 844-8937.



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OYSTERS

(Continued from Page 18)

ter that has a temperature between 35 and 45°F, visibility of two to three feet and a depth of 15 to 25 feet. Swimming around on the bottom, the divers select the oysters they want and place them in a mesh goodie bag. When it gets heavy, the diver ascends, swims back to the boat and passes the bag to the captain or mate on board. The contents of the bag are dumped onto a culling board and the bag is returned to the diver, who then searches for more oysters.

While the divers are down, the captain and mate cull, or select, only those oysters suitable to keep, returning the rest to the water. This operation is important because many times inexperienced divers forget that objects are magnified by 25 percent underwater and often bring up undersized oysters. Marine police usually check each boat and possession of undersized oysters can result in stiff fines.

The suitable oysters are dumped on the deck of the boat or stored in baskets. Upon returning to port, they will be evenly divided among the divers.

If your oyster dive has been well planned, you will have an older, nondiver on board who has spent an entire lifetime



photo/Ellsworth Boyd


developing a secret recipe for oyster stew. This galley-gourmet will have secured a small stove and all the fixin's. After you have exhausted your first tank of air and climbed back into the boat, you will find the world's greatest chef standing in front of a steaming pot of oyster stew that defies description. The aroma alone will awaken every sense you possess. Anyone who can drag his/her tired carcass from the cold, murky depths on a brisk winter morning and not enjoy a hot bowl of oyster stew should be given a decent burial at sea!

After you have finished the stew, eaten numerous raw oysters and rested, it's time for more diving. The second dive is usually more productive than the first. The divers are now familiar with the area

and can find the oysters with more ease. Everyone is determined to reach the quota of one bushel per person.

After the second and final dive, the divers start packing their gear. You would be amazed at how many bottles of peach brandy are found hiding in the corners of dive bags!

On the return trip to port, time is usually spent getting rid of the brandy and talking about what each diver is going to do with his/her oysters. Many will be consumed on the half-shell at Saturday night parties. Others will be taken home to be converted into stews, fritters and dressings or will be fried.

However you should decide to consume yours be forewarned: The oyster may be the world's best aphrodisiac! 

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Oysters with shells
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Bread or cracker crumbs

Swiss cheese, grated

Melt butter and add herbs to taste. On each oyster left on the half shell place a teaspoonful of *fines herbes* butter. Sprinkle with crumbs. Add a little grated Swiss cheese. Place under broiler until cheese is browned and oysters are heated through. Serve immediately.

MR. PACA'S OYSTER SOUP

½ gallon freshly shucked oysters

¾ C butter

Flour

½ pint cream

Pepper

Salt

Mace

Stew the oysters in their liquid. When they are half cooked, add the butter and enough flour to thicken the stew. Season with pepper, salt and mace to taste. Just before serving, add the cream.

OYSTER STEW

2 T butter

2 T celery, finely chopped

1 T onion, finely chopped

1 quart freshly shucked oysters

1 quart milk, heated

1 T Worcestershire sauce

1 teaspoon salt

½ teaspoon cayenne pepper

Paprika

Melt the butter, add the celery and onion and cook until tender. Drain the oysters, add them to the mixture and cook slowly until the edges curl slightly. Add the milk and Worcestershire sauce and heat until the oysters are fully curled, being careful not to overcook. Add the salt and cayenne pepper and serve at once, placing a small lump of butter in each bowl. Garnish with paprika.

MARYLAND PAN FRIED OYSTERS

1½ pints (24 ounces) shucked oysters

2 eggs, beaten

2 T milk

1 teaspoon salt

Pepper

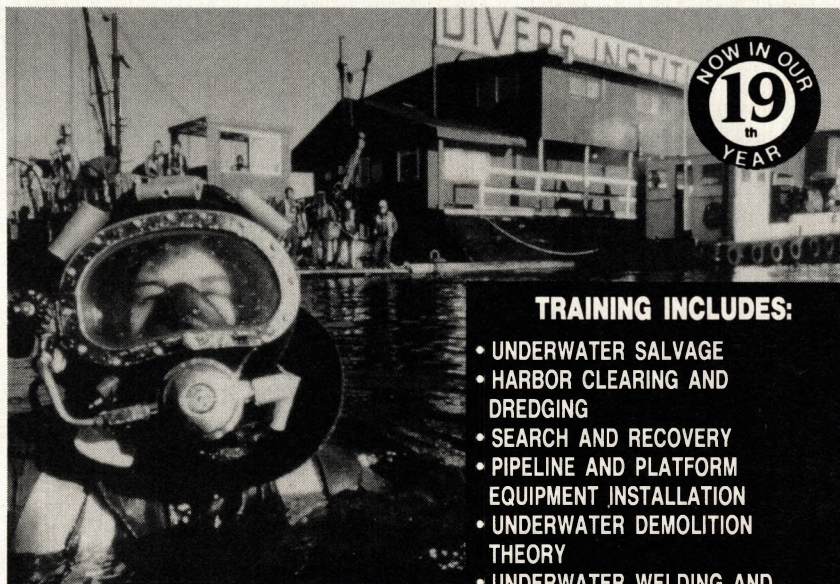
1½ C dry bread crumbs

1½ C flour

Margarine, butter or oil for frying

Drain the oysters. Mix the eggs, milk and seasonings in a bowl. In another bowl, mix bread crumbs and flour. Roll the oysters in the crumb mixture, dip them in the egg mixture and roll again in the crumbs. Fry the oysters over medium heat, in oil just hot enough to keep them from sticking, until brown on one side (three to five minutes). Turn the oysters carefully and brown the other side. Drain and serve immediately. Makes six servings, about eight oysters each.

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photos/courtesy Munson Workboats

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BY DAN MONTGOMERY

When you own a boatbuilding operation that specializes in custom designed, aluminum vessels, it just makes sense that your own personal boat would be something, well, out of the ordinary. That's why I knew Bill Munson's personal Hammerhead 26 would be an experience. I was *not* disappointed.

Affectionately dubbed the *Sledgehammer*, this 26 foot, welded aluminum beauty is the perfect marriage of form, function and material. Like all Munson's Hammerheads, the *Sledgehammer* is built atop a one-quarter inch aluminum V-hull with wide chines. This type of hull offers superb heavy weather performance, excellent stability and a very shallow draft. It is also virtually indestructible.

On the day of our sea trial, the sun was shining over the Edmonds, Washington marina, where *Sledgehammer* is berthed, and the dark waters of Puget Sound were a deceptively placid mill pond. Our goal was a hidden dive site called the Octopus Pit, a 150 foot hole in the sound on the southern tip of Whidbey Island.

We loaded our gear, securing the tanks in place with custom tank holders built onto the wheelhouse. The eight foot, six inch beam provides an incredibly stable platform—heavy gear is loaded and unloaded with no trouble.

The *Sledgehammer's* deck configuration makes it a perfect dive boat. A large, comfortable wheelhouse accommodates four passengers on padded seats (each



The *Sledgehammer* is Bill Munson's personal, custom outfitted creation. She can cut comfortably through a stiff chop at 30 mph. Building up from the same basic Hammerhead hull as the *Sledgehammer*, you can create your own dream boat. With a welded aluminum V-hull and wide chines, the Hammerheads offer superb heavy weather performance. The illustration at right is for a 32 foot Hammerhead being built for Kona Coast Divers.

covering a storage area for gear or a foam lined cooler) plus the skipper. Two steering stations allow the operator to run the boat from inside the wheelhouse or from a center console on a raised aft deck platform. This raised deck is constructed of diamond plate, 3/16 inch aluminum and provides a staging area for divers that can withstand any amount of abuse from tanks or weightbelts.

Powered by a 460 cubic inch Ford (generating 336 horsepower) and pushed by a 1031 Hamilton Jet engine, the *Sledgehammer* promised an interesting ride to the dive site.

Checking over his shoulder to see that the gear was secured and the passengers seated, Bill Munson asked quietly, "Are you ready?"

Ready: As the gas fed those 336 horses, the *Sledgehammer* lifted up out of the water and flew! Drawing only 18 inches normally, the Hammerhead hull stepped up out of the water at cruising speed to draw a scant 12 inches. As the Hamilton Jet draws water through its intake duct and shoots it through the propulsion nozzle, it provides one of the most efficient conversions of energy to speed available to a boater. At 35 mph, we were burning just eight gallons per hour with 3,000 rpm. Wide open, the *Sledgehammer* pushes an honest 45 mph, yet the revolutions per minute remain 1,000 under top end. This boat is efficient.

The Octopus Pit is roughly eight miles as the crow flies from the Edmonds marina. We made the trip in just 15 minutes, with an extremely comfortable ride and conservative fuel consumption. As we approached the site, Bill flipped on the

Sledgehammer's II Morrow Loran C and a Furuno Video Chart Recorder, both conveniently mounted above the interior steering station. Entering the proper waypoints on the Loran, we eased toward the site, stopping at 122 degrees 22.28 latitude; 47 degrees 54.27 longitude.

I was convinced we'd made a mistake. The video recorder showed hard bottom at 15 feet. We were less than 100 feet from the beach. Hanging over the rail, I could clearly see the long strands of bull kelp streaming in the current and make out rocks below us.

"Watch this," Munson called, indicating the sounder. We eased five feet to port and the bottom dropped from 15 to 150 feet. We were there.

When we broke out the dive gear, I saw there was ample room on the aft deck for four divers to suit up. Surrounded by a high railing, this raised deck provides an excellent area for organizing gear, fishing or sunning. Our only problem now was waiting for the photo boat to show up; we'd left it far behind just minutes from the Edmonds marina.

Opting to dive first and take pictures later, we explored the depths of the Octopus Pit. It was named, obviously, for the residents. Unlike their smaller tropical counterparts, the octopuses of Puget Sound (*Octopus dofleini*) are known to reach 20 feet in diameter. The residents were home, watching balefully with large, nearly human eyes. The photo boat was in place as we resurfaced and prepared to put the *Sledgehammer* through her paces for the camera. As we reboarded the boat via a tubular aluminum dive ladder (each of us weighing an easy 250

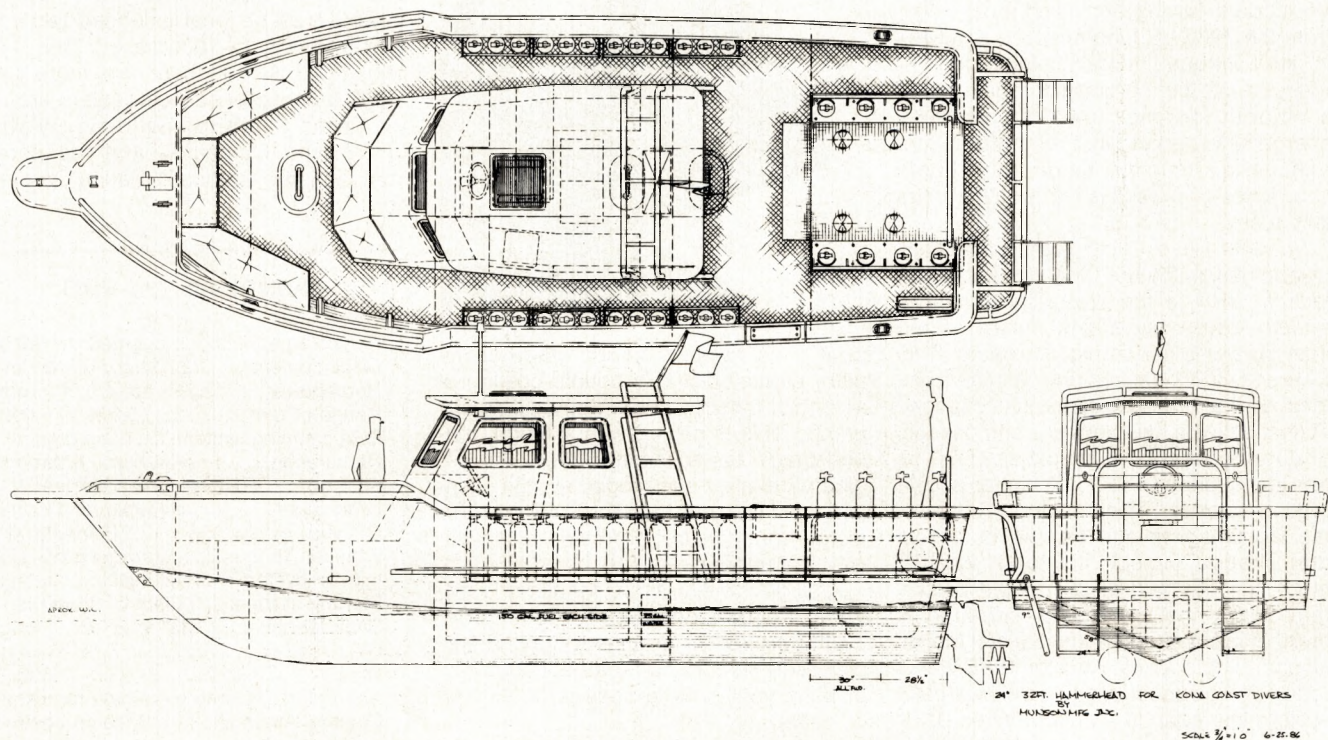
pounds with lead, tanks and wet neoprene) I was amazed to see virtually no list at all as the divers came over the side. This is one stable dive boat!

To understand Munson's boatbuilding philosophy, it helps to have an idea of the background of Munson Manufacturing. The boats produced from his Edmonds facility (each handmade by skilled aluminum craftsmen) are the result of years of testing in the roughest water in the world: the Gulf of Alaska. As a commercial salmon fisherman, Munson saw every type and configuration of working vessel and virtually all of them shared a common disadvantage: They were production vessels modified to fill a need.

The Munson approach is the opposite. He offers the "perfect" bare hull design and then proceeds to build the boat from the hull up with the end use as the primary criterion. The *Sledgehammer's* hull, for example, could have been used as a fireboat, a crewboat for oil rigs or a commercial fishing vessel. Bill's particular need was for a true all-purpose Puget Sound vessel; a boat that lends itself to diving, salmon fishing or family cruising. The *Sledgehammer* is exactly that.

The net result of all this design philosophy is the production of a genuine dream boat—the boat you always imagined, but could never seem to locate.

This flexibility is what attracted Jim Robinson of Hawaii's Kona Coast Divers. Starting with a basic 34 foot Hammerhead design and utilizing the 24 degree deep-V, Robinson and Munson sat down and designed the perfect vessel for the Kailua-Kona operation. The result is a dive boat with a 12 foot beam, racks for



EVINRUDE 225

TEXT AND PHOTOGRAPHY BY GREG JOHNSTON

It was Ole Evinrude who introduced the first popular outboard motor in 1909. This revolutionized the motorboating industry. Since those early workshop days, the Evinrude Corporation has led the way with many new and innovative ideas. This year, Evinrude has stepped up its efforts to lead the industry by introducing the first automotive-type power steering system for outboard motors.

The new steering unit is designed to easily adapt to your boat's standard hydraulic or mechanical steering system. Mounted in the engine housing is a belt driven hydraulic pump with reservoir that delivers oil under pressure to an activating cylinder. When the steering wheel is turned to port or starboard, a spool valve directs oil from the pump into the cylinder. This cylinder moves the engine and eliminates steering torque.

When Evinrude introduced the 90 degree V-block engine design to outboard motors more than 30 years ago, every outboard motor manufacturer used the V design. The 225 VRO engine is no different, however, many new features for 1986 make this one of the most advanced V6 engines on the market today. The 225 has a 165 cubic inch block with two rows of cylinders set at 90 degrees for better mechanical balance. The engine is slightly larger than the standard V6 models, having borrowed technology from the 1985 V8 loop charged engines. In an Evinrude "looper," fresh fuel is charged into the combustion chamber in a smooth looping flow. The exhaust charge is forced out into the pulse tuned exhaust system the same way. Loop charging's end result is more power from less fuel.

Variable Ratio Oiling (VRO) is a truly unique design feature for automatic oil injection. VRO is the first oiling injection system driven by engine pulses rather than conventional crankshaft gears. The Evinrude VRO senses the engine rpm load at the moment of throttle change. Then it delivers the exact gas and oil ratio mixture needed, from as low as 150:1 at low idle speeds to 50:1 for higher accelerating speeds. This feature eliminates the lag time between change of speed and change of fuel mix ratio. What's more, the gas and oil are mixed before they reach the crankcase, creating a more efficient and economical fuel mix at all operating speeds. Also for 1986, Evinrude has introduced a new no-oil warning system that sounds an alarm when oil is no longer being pumped into the fuel mix.

Other features of the Evinrude 225 are precision calibrated bearings, rods, wristpins and specially designed wedge-shaped piston rings for less friction and cooler running. Electronic ignition is standard equipment, as is an integrally designed carburetion system that utilizes engine intake runners and reeds, providing increased efficiency over previous designs. Every new Evinrude has a solid forged, even firing, six pin crankshaft for improved idling; a new gear starter for positive engine turnover; and a 35 amp alternator to supply a greater range of electrical supplies. The 225 VRO includes an advanced cooling system that responds to throttle increases and a shift interruptor that momentarily impedes the ignition system for smoother shifting of the gears.

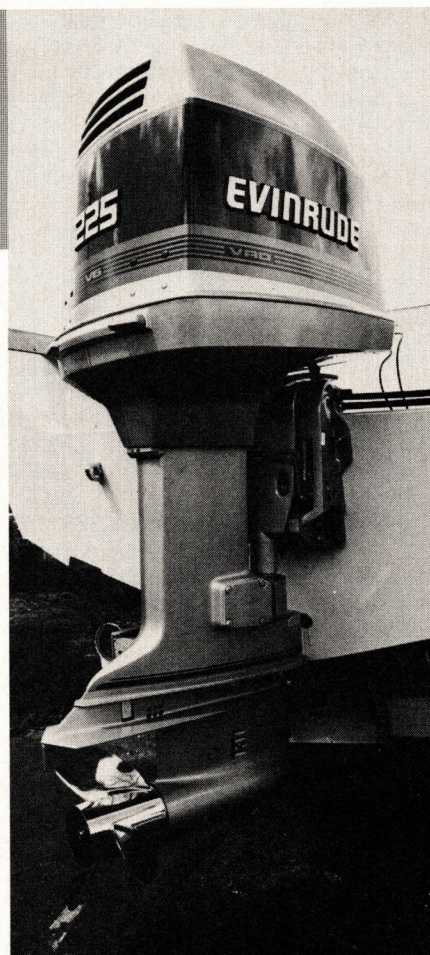
A closer look at the engine reveals Evinrude's 77 year reputation for saltwater corrosion control. Each engine is cast



from a low copper, marine grade aluminum, protected with a double coating of a special Lyfanite and chromated epoxy primer. This is sealed with a tough, marine grade baked enamel paint. All engine parts are bolted together with stainless steel fasteners and the engine is protected from galvanic corrosion by sacrificial zinc anodes.

A single switch on the throttle grip adjusts the trim and tilt of the engine. Equipped with a stainless steel Raker propeller, the 225 hp motor is capable of pushing your boat to speeds of 50 mph or better.

Basic instrumentation includes a digital



Quartach tachometer and warning lights indicating the lubricating oil supply level. A variety of optional accessory gauges is available.

Base price for the Evinrude 225 VRO is \$9,434 with power steering. All new Evinrudes come with a one year warranty, however, an optional extended two year warranty can be purchased. The best part of all is that there are more than 3,500 authorized service dealers around the United States, owing to the divisions of Johnson Outboards and the parent company, the Outboard Marine Corporation (OMC).

EVINRUDE 225 VRO

Engine type.....	Loop charged V6 (90°)
Displacement.....	2,700 cc/165 cu. in.
Horsepower.....	225 hp at 5,500 rpm
Range of rpm.....	5,000 to 6,000
Fuel charging system.....	Loop charged
Carburetion.....	4 carburetors, 6 throats
Fuel type.....	Regular (unleaded/leaded)
Lubrication.....	Variable ratio oiling
Oil type.....	Evinrude XP
Exhaust.....	Through prop hub
Ignition system.....	Fuel injected starting
Starting system.....	Electric 12 volt key
Shaft length.....	20" long, 25" X-long
Gear ratio.....	14:26 (.54)
Weight.....	455 lbs.
Alternator.....	35 amp w/voltage regulator
Cooling.....	Automatic throttle-temp control

MUNSON CUSTOM

24 tanks, storage for 16 BCs and an aft staging area with stern entry from a dive platform. Dive ladders are mounted port and starboard of the swim platform and an additional fold out dive door is built on the port side. Powered by twin 200 hp Volvos, it features a freshwater shower and a custom camera locker. She's certified for 16 passengers plus crew and will top out at 35 mph. In short, she's exactly what Robinson wanted for his operation.


Our return trip to Edmonds showed a bit of what *Sledgehammer* could do. A fair breeze had blown up and the calm water had grown a stiff chop. With a 16 degree V, the hull cut the chop and the wide chines softened the ride. We rode comfortably at 30 mph through a sea that would have jarred your molars at that speed in a conventional hull.

Sledgehammer boasts a range in excess of 300 miles—not bad for a 26 footer! On top of her functionality, she is a beautiful boat. The lines are pleasing to the eye and the whole design seems to generate a sort of forward motion; even at rest this boat seems to say, "C'mon, let's go!"



Because it completely eliminates the need for propellers, the Hamilton Jet is an extremely safe, efficient propulsion system for a dive boat. Here a diver is actually being pulled through the water at three knots while holding onto the jet engine.

Although Munson would rather sell you a couple of his fingers than his *Sledgehammer*, you can get a sister ship (modified for your needs) for about \$45,000.

For details on the Hammerheads, call (206) 776-8222; or write: Munson Boats, 150 West Dayton, Edmonds, Washington 98020. 

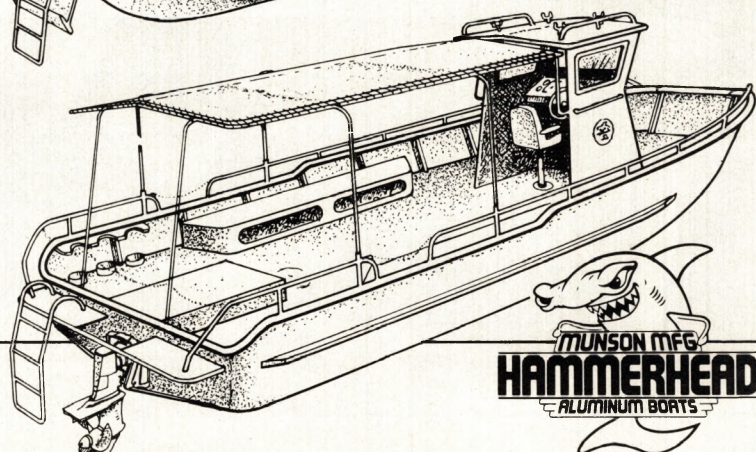
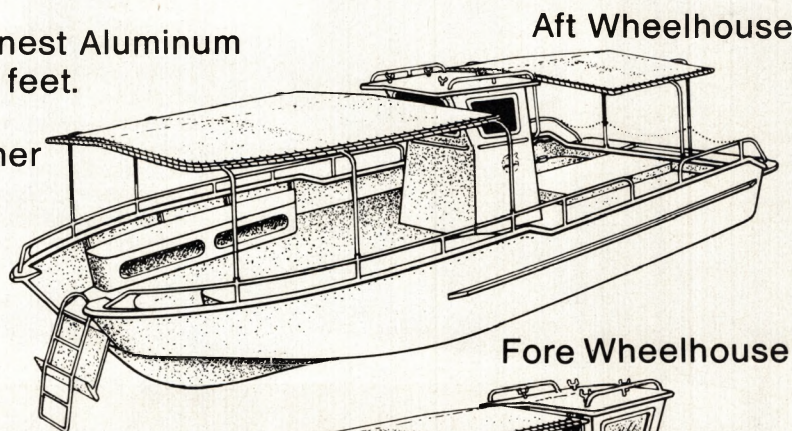
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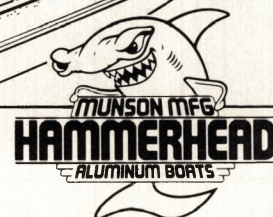
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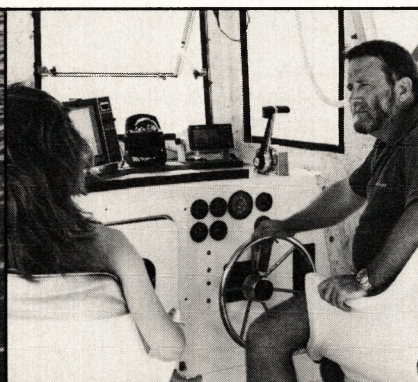
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PRIVATEER 2100

TEXT AND PHOTOGRAPHY
BY STEVE LUCAS



With fully enclosed Peconic cabin, grab bars, bunks, bow rail, hardware package, lights, stainless steel wheel, hydraulic steering, tank racks, a Step-On dive platform, twin captain's seats, coolers and OMC 2.5 Sea Drive, the average price of the Privateer 2100 is under \$22,500.



You can bet on it: I won't ever forget the first day I saw a Privateer. Three years ago, on an 80°F April day, I left Miami with the sun shining over a calm sea. When I stepped off the plane in New York City a dark gray sky unmercifully spat snow in my face. Only a day earlier I had spoken to Bill Lieblein at Southold's Port of Egypt Marine: "Sunny and in the 70s," he reported. But he didn't warn me that the weather in New York can change overnight or caution me to bring a coat!

I recall wondering what a fair weather fellow from Florida was doing wearing a borrowed jacket on the east end of a cold Long Island. The water on sheltered Southold Bay, 100 miles from New York City, had been driven by a stiff wind to create a sloppy two foot chop. Between Long Island and Shelter Island the waves were a nasty three feet and we were flying into them at full throttle. I would be less than honest if I said I was enjoying myself, but I was impressed. The Privateer's ride was amazing. Instead of flying off one crest and crashing down on the next, we were cutting through the waves just like the proverbial hot knife through warm butter! (See SDM, August 1983.) Owing to its weight, unique design and solid stand-up cabin, the ride was comparatively smooth and not a drop of icy seawater was getting to us. I won't forget the first time I saw a Privateer.

I've seen and dived from a lot of them since then. Several Privateers are in use in Bonaire and other Caribbean islands as commercial dive boats. I have listened to their owners rave about the boats' virtues, construction, durability and ride. When SKIN DIVER asked me to look at another Privateer I was ready, but a little apprehensive. My first question was not

which boat, but where?

Privateer's dealer network has grown substantially in the past three years, so this time we were able to stay on home seas to check out and photograph the rugged Privateer 2100 with its Peconic cabin. Grant Meyers of Hollywood's Scuba Marine Products eagerly provided a fully equipped boat. Largely a scaled down model of the 2400 Renegade we had tested three years earlier, the 2100 has virtually all the same features that make its larger cousin so rugged.

Designed and built in North Carolina by master boat builder Warren Wilkerson and his crew, the fiberglass laminated hull is 100 percent laid by hand. At the keel the 2100 has six layers of 24 ounce woven roving and ten layers of one and one-half ounce mat. The bottom has four layers of the 24 ounce woven and six of the one and one-half ounce mat. At the chine, where a lot of the shock is absorbed and water deflected, four extra layers of the one and one-half ounce mat are added. The boat's hull is so solid the bottom is more than an inch thick! When drilling through the hull to add transducers for fathometers, some first time owners simply can't believe how far they have to push the drill.

There are a lot of boats out there that go for glitz and glitter, it's what most owners want—at first. But when the glass on the deck begins to crack and the gel coat

begins to chip because someone keeps dropping a weightbelt, the new boat owner often begins to wish for something more rugged. Of course, at the other extreme, there are boats that don't offer much in the way of looks and are very tough. But there just aren't many in the middle. The perfect personal dive boat, which looks good and will last, definitely falls somewhere between those extremes. The Privateer might be that boat.

Wilkerson gained much of his expertise while working for nationally known boat manufacturer Grady-White. As their superintendent of quality control he learned everything necessary to create a tough, good looking, work/pleasure craft. With the basic hull designed to workboat standards, many Privateers see heavy duty use in the Northeast as commercial oystering and gillnetting boats. Built to take a lot of abuse, a Privateer's deck and hull can stand up admirably to dropped weights, heavy gear bags and the banging of rolling tanks.

At 21' 6" the 2100 is somewhat wider than most others in its size range: It has a beam of 8' 4". Aft, the freeboard is 24½ inches while the hull takes on barely 10 inches of water. Weighing approximately 2,700 pounds, including Peconic cabin and an OMC 2.5 Sea Drive, its maximum power is 235 hp. However the boat will plane with an engine of only one-fifth that size. Power can be provided by the OMC


Sea Drive, an outboard or a stern drive. A 62 gallon aluminum tank is provided standard for extended running.

With six divers and all gear, the boat handles unusually well. Fully loaded it can hit speeds of 25 to 30 miles per hour. Its weight makes it want to stick to the water even in rough seas. It is a dry running boat owing to wide chines that keep the spray on the ocean until it is well past the center of the boat. This is one boat you can take well offshore with little concern about changes in weather.

The boat can be ordered in any number of configurations using the same basic, open 2100 Roamer II hull. There is also a choice of two cabins, either the Shelter Cabin with windshield or the one we find to be most useful, the Peconic. With 6' 4" of standup headroom for passengers, the solid cabin can protect you from spray almost without regard to how hard the wind is blowing. You can even order it with the optional 6' 4" V-berth to sleep two. Of course, when you aren't using the cabin for overnight purposes the space can be utilized for storage.

The price of the Privateer 2100 Peconic is amazingly low. With cabin, grab bars, bunks, bow rail, hardware package, lights, stainless steel wheel, hydraulic steering, tank racks, a 22 inch Step-On dive platform, twin captain's seats, coolers and OMC 2.5 Sea Drive the average price is still under \$22,500.

Very popular in the eastern U.S., the Privateer can be found at many dealers across the country. For a package of additional information and the name of a dealer in your area, contact Warren Wilkerson, President, Privateer Boats, P.O. Box 69, Chochwinity, NC 27817; (919) 946-7772. In South Florida contact Grant R. Meyers, Scuba Marine Products, P.O. Box 7671, Hollywood, FL 33021; (305) 981-7728. In New York, contact Bill Lieblein, Port of Egypt Marine, Route 25, Southold, NY 11971; (516) 765-2445.

You can bet on it: You won't be able to forget the first time you take a ride in a Privateer either! 



Designed and built in North Carolina by master boat builder Warren Wilkerson and his crew, the Privateer 2100's fiberglass laminated hull is 100 percent laid by hand. Many Privateers see heavy duty use in the Northeast as commercial oystering and gillnetting boats. The 2100 can be ordered in any number of configurations using the same basic, open hull design.

The Privateer 2100 is 21' 6" long and has a beam of 8' 4". It can be powered by an outboard, stern drive or, as shown, with an OMC Sea Drive. Maximum power is 235 hp, but the boat will plane with an engine one-fifth that size. A 62 gallon aluminum fuel tank is standard for extended running. The hull is ultra-solid, more than an inch thick at the bottom. With six divers and gear, the boat shown was able to reach speeds of 25-30 miles per hour and handled unusually well. The boat's weight makes it stick to the water, even in rough seas.



Technifacts

BY E.R. CROSS



President Reagan declared 1985 The Year of the Ocean. Americans were asked to reflect on the importance of these bodies of water; to consider them as a source of food, minerals and as a place for recreation. While I believe The Year was of importance in drawing the attention of the people of the United States to the potential resources of the seas, there should be none but a very cautious celebration about the abundance of life in them. It is dangerous to think such resources are unlimited. Fishermen of all kinds, including sport diver/fishermen, know from experience with declining catches that we are dealing with a finite resource in *all* aquatic environments. This includes not just the oceans but also all the lakes and rivers of the world.

A few years ago it was popular for writers to affirm that the oceans could supply

the food needs of all the peoples of the world. This was not true then and it is even less true today. While the overall volume of all the waters of the world may be large enough to contain the aquatic life needed to support the total population of the world, the thing most needed for any great abundance of such life is lacking. That is a habitat in which an unlimited number of each of the many forms of water dwelling life can deposit either eggs or young and where these small beginnings can reside during the periods of incubation and growth from juvenile to adult life forms. The biotic potential of aquatic life is usually limited by the restricting influence of a less than ideal environment. Particularly lacking are adequate habitats in which adult life can seek refuge from predators.

Research divers and many observant

sport divers know the bottoms of lakes, rivers and oceans are mostly barren expanses of sand, mud or flat rock formations. The environmental fitness of such areas is basically nil except for a few specialty life forms that have become adapted to them. Aquatic life will be found in abundance only along the comparatively few cliffs, reefs, rock outcroppings and similar structures, either natural or artificial. This lack of environmental fitness greatly restricts the potential biomass of an area.

This is evidenced in a report from Japan. The continental shelf surrounding Japan, i.e., the ocean from the shoreline to a depth of 100 fathoms (600 feet), occupies an area of 242,000 square kilometers or about 93,412 square miles. In years prior to 1976 the total annual harvest of marine fisheries from Japan's

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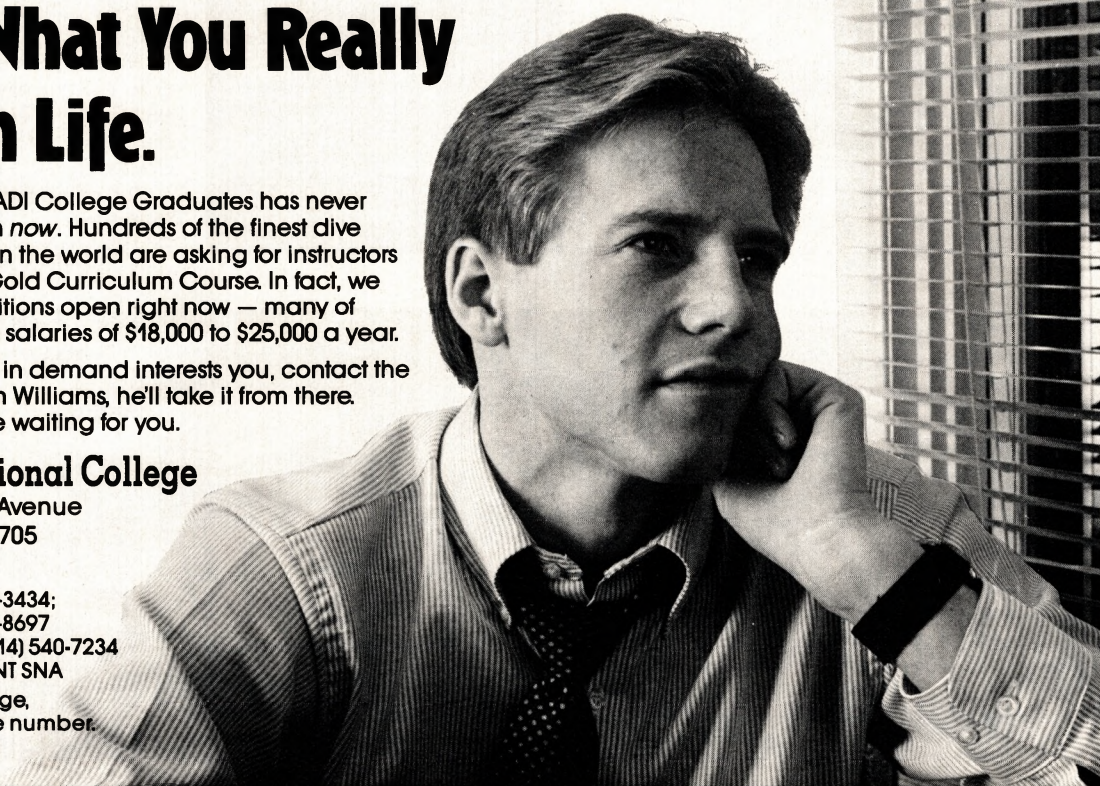
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continental shelf was about 10 million tons. Since 1976 Japan has been active in developing about five percent of its continental shelf by the use of manmade fishery enhancement devices. It is expected that the development of this relatively small part (only five percent) of the continental shelf will increase the productivity of the area by nearly five million additional tons of marine fisheries products.

FISHERIES ENHANCEMENT DEVICES

The very nature of the bottom of a body of water is that it has a basically plane surface. It is usually, or at least predominately, a single flat surface covered with sand or is covered with comparatively thin rocky or coral outcrops. Along the shorelines there may be exceptions to this in underwater cliffs of rock or coral. These conditions provide a relatively limited number of habitat niches and can therefore support only a limited population of organisms.

This natural condition of limited biotic areas, with resultant population pressure within the biota, has been further aggravated by fishing pressure, habitat loss owing to man's encroachment into many marine and freshwater sites and as a result of pollution of various kinds. Collectively, all of these have made a serious impact on the fisheries in most areas of the world, but particularly in regions impacted by industrialized countries. In many parts of the world, in both freshwater and marine environments, there is an increasing use of habitat enhancement devices to mitigate losses to fisheries and other marine resources.

Enhancement of these relatively limited, adversely impacted, habitats can be accomplished by the use of either fish aggregation devices or artificial reefs. Fish aggregation devices are usually floating structures used to attract pelagic species. Artificial reefs are used to attract demersal life forms. Under certain conditions either type structure will function to attract both demersal and pelagic life forms. This month's Technifacts will deal primarily with artificial reefs, with emphasis on how they affect sport diving, and with the suggested relationship of all divers to manmade reefs.

MANMADE REEFS

To offset the adverse effects of overfishing, habitat loss and pollution, fisheries authorities in many areas of the world have turned to the use of various kinds of habitat enhancement devices to attract and retain fish populations in specific areas. Probably the most permanent, and certainly the devices that most impact diver activity, are artificial reefs.

Seagoing fishermen in the United States started using artificial reefs to improve their catches as early as 1860. In

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TECHNIFACTS

Japan, as early as the late 1600s, rocks were placed in otherwise nonproducing areas to enhance the growing of kelp, which was later harvested. Today, in some sections of the globe, the placement of rocks is all that is done to provide habitat enhancement for various types of marine life. In general, however, artificial reefs are more complex and often are designed for a specific type of marine life.

John J. Naughton, fishery biologist of the National Marine Fisheries Service in Honolulu, told me, "Artificial reefs have been around for a long time. At first they were basically dumping grounds for junk. In recent years there have been tremendous advances in the design, placement and management of artificial reefs."

The science of utilization of artificial reefs to enhance an environment is expanding rapidly. To be a successful endeavor, and to increase species production, it seems to me there must be a careful balance among existing environmental conditions, number of artificial reef structures installed and the harvest of species from the reefs. Overzealous introduction of artificial reefs and overharvesting of the total biomass may lead to depletion of one or more species or to an imbalance



Three Hawaii State Fish and Game Department divers make a fish count on Junk Car Artificial Reef in Maunaiua Bay, Oahu in 1962. Rust is all that remains of this reef now.

of the entire local ecosystem.

John Naughton told me: "One thing that might be done to keep the environment in balance is to design and plant an artificial reef designed just for rearing juveniles of several species. Perhaps 100 meters away, have a similar, related reef, suitable for adults of these species." He explained, "Since the reef for juveniles would not produce fish of usable size, it would not be worked by fishermen but would be a constant source to populate

the adjacent reef with adults of worthwhile size."

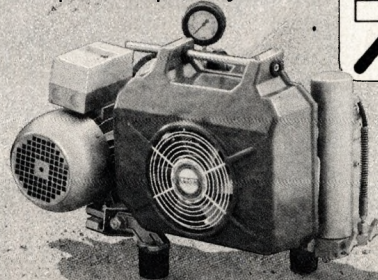
Later, when we were discussing why artificial reefs work as well as they do, John said, "Some artificial reefs produce turbulence and upwelling of passing currents. This latter brings nutrients and food. Fish can be seen feeding in the water column above the structure. When predators close in, the feeding fish drop into the artificial habitat for protection."

There have been many trials of many

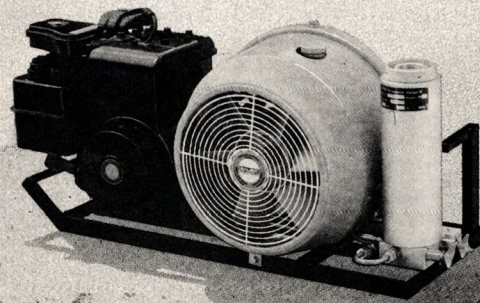
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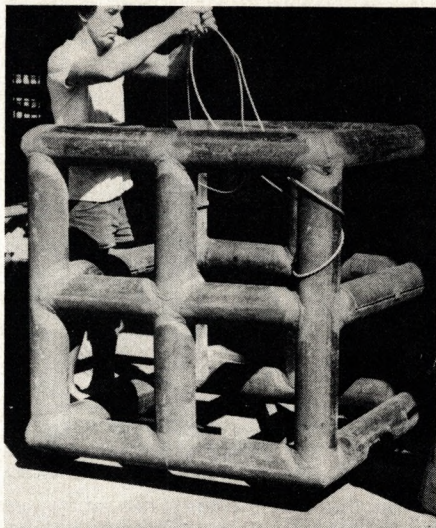


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photo/Bob Grace

This is one of the modules for the University of Hawaii's research artificial reef.



photos/John Naughton

This is the completed "apartment complex" artificial reef in Maunalua Bay at a depth of 65 feet (1985). The research diver is making a fish count and marine life study.

materials in efforts to create an acceptable artificial reef, many of them, as John said, basically dumping grounds for junk. The first extensive trials I know of in Hawaii (in the 1960s), were the use of old cars dumped from barges into the water between Koko and Diamond Heads. There is now nothing left of these except an occasional steering wheel column, axle or other piece of heavy metal. The most obvious signs that something was once there are the heavy, rust colored

stains along hundreds of yards of once white ocean bottom. This is the iron oxide precipitate that was once a bunch of very used cars.

Just what effect the abundance of iron oxide has on marine life is not known. Some mollusks pick up the iron oxide and deposit at least part of it in their shells, turning what would have been a normally marked species into a rusty-appearing specimen. In the few specimens of "rusty" cowries (*Cypraea maculifera*

mostly) I have collected for study from areas of junked cars or sunken steel vessels, there seems to be a higher percentage of aberrant shells, usually in the form of a very nodulous dorsal shell surface.

In the Gulf of Mexico, many of the U.S. owned oil production platforms that have ceased to produce are being cut off at the ocean bottom. The tower is allowed to topple into the ocean where it becomes a heavily populated artificial reef.

In 1916 the Boatman's Association of

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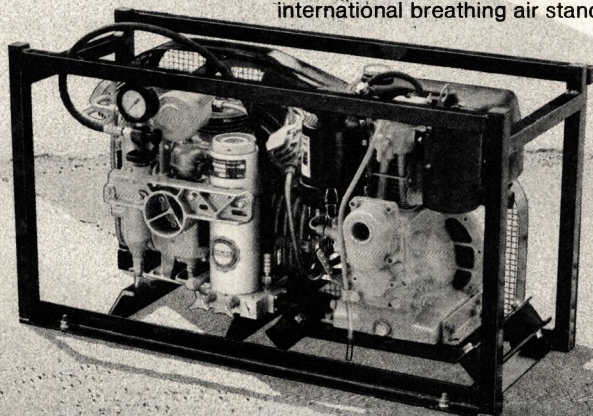
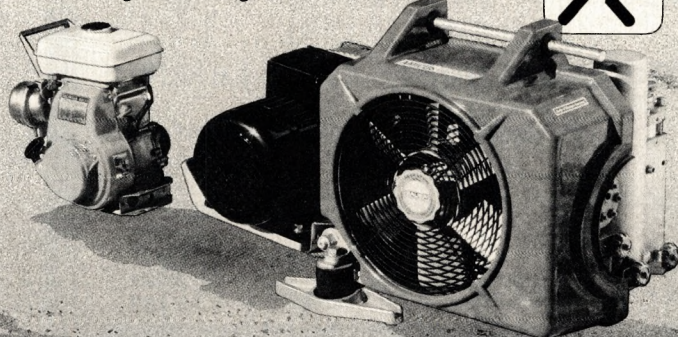
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TECHNIFACTS

Great South Bay, New York filled hundreds of buttertubs half full of cement and sank them as a reef. The McAllister grounds of Long Beach, New York, were built from the debris of demolished buildings in the 1950s. The Schaefer Beer Case Reef, off Fire Island, New York, was built from 14,000 concrete filled Schaefer beer cases. Concrete filled tires of various sizes and configurations have also been used to make artificial reefs. And, in 1935, four vessels and tons of other material were sunk in a New Jersey fishing preserve. There has also been work done on freshwater habitat improvement, first by planting brush and tree shelters and, later, with more sophisticated designs.

Today, the most popular material for artificial reefs is concrete forms of various shapes to conform to the area to be developed or to gain the desired results. Their function is to provide a firm substratum to which the biota can become attached and, secondly, to serve as a refuge for both plant and animal life to prevent complete denudation of the habitat. The concrete forms may be large, flat slabs lying on a flat, but uneven, seabed—or highly complex forms stacked to various heights depending on other uses



Small diameter or partially blocked larger diameter pipes make a better habitat for fish than large, open pipes. These pipes were placed on the bottom in 75 feet of water during a period from 1971-1973 and the photo was taken in March of this year.

of the area by boats or larger vessels or trawling, etc.

The recent publication *Artificial Reefs; Marine and Freshwater Applications*, by Frank M. D'Itri (Lewis Publishers, Inc., 121 South Main Street, Chelsea, MI 48118; \$49.95), provides a vast amount of information for all concerned with artificial reefs and fish aggregation devices. The author states in the preface, "In this book fisheries biologists, ecologists, limnologists, oceanographers, aquatic resource managers and planners, commer-

cial fishermen and environmental scientists are offered information on the latest artificial reef designs and placement methods and ecological research as well as an overview of the current United States legislation and regulations."

Another recent publication dealing with artificial reefs is Volume 37, No. 1 (July 1985) *Bulletin of Marine Science*. This is the published report of the third international artificial reef conference held November 3-5, 1983 at Newport Beach, CA.

(Continued on Page 130)

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British Virgin Islands

DIVE GUIDE

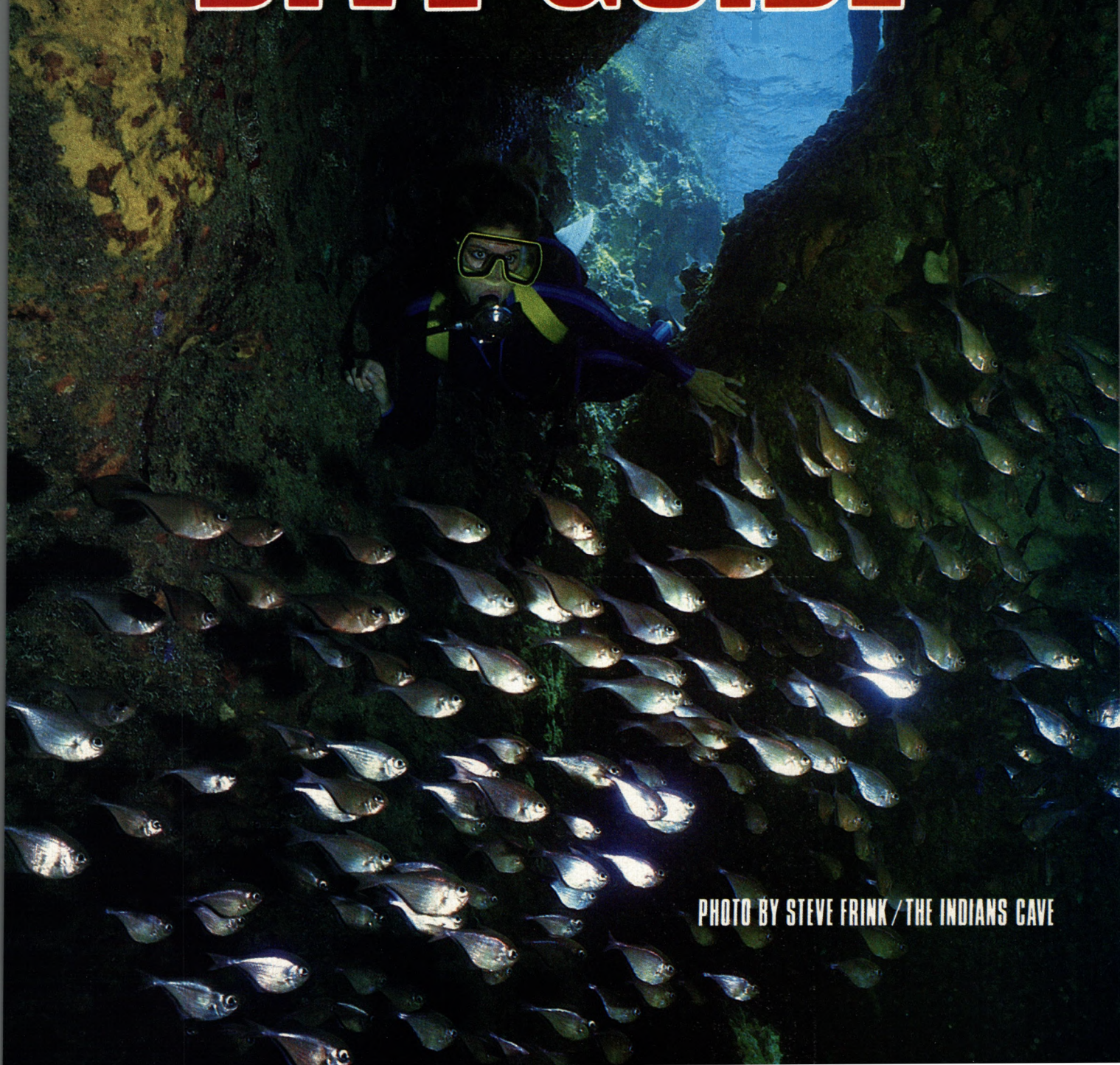


PHOTO BY STEVE FRINK / THE INDIANS CAVE

There is a slogan in the British Virgin Islands that describes the overall attitude toward tourism, "It is not how many come, but how many come back." The sell is more subtle than hard, the ambiance more informal than structured, and the feeling more tranquil than hectic. Based on the quality of the dive potential, the excellence of the dive operations, the beauty of the topside elements of the islands and the variety of available accommodations, travelers are visiting the BVI in ever increasing numbers. With many of the resorts, live-aboard dive boats and crewed and bareboat charter boats enjoying almost 30 percent repeat rates, the British Virgin Islands are becoming a significant

dive destination.

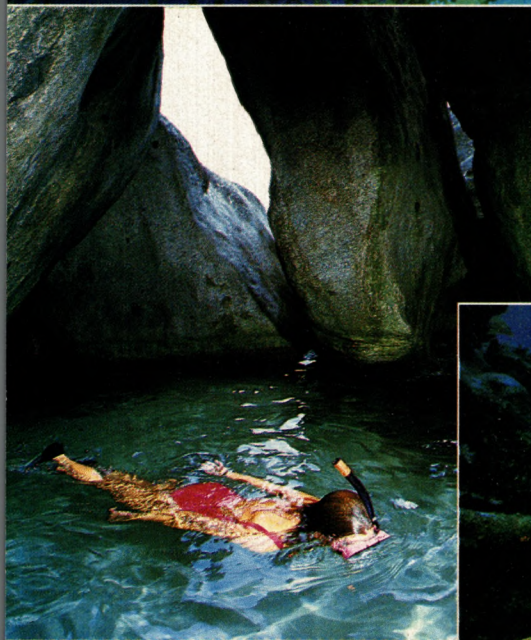
The initial charm of this area is visual. The waters are a beautiful aquamarine and mountainous islands resemble a handful of emeralds scattered randomly about the central marine thoroughfare, Sir Francis Drake Channel. Lying some 60 miles to the east of Puerto Rico, the British Virgin Islands are comprised of more than 50 islands, rocks and cays, although many are uninhabited. The total land area is only 69 square miles and supports a population of about 12,000. More than two-thirds of the 25 hotels and guest houses throughout these islands have their own marinas, a testament to the priority hoteliers place on the aquatic aspects of their guest's vacations.

The islands bear such enticingly quaint names as Fallen Jerusalem, Prickly Pear, Great Dog, Ginger Island, Great Thatch, Jost Van Dyke and Deadchest, to mention but a few. However, the main center of population and commerce is Tortola. Air traffic to the British Virgin Islands arrives at Beef Island, which is connected to Tortola by the narrow, one lane Queen Elizabeth Bridge. During our most recent visit we flew direct from Miami aboard the British Caribbean Airways 80 passenger jetliner. This airline offered excellent service and the most expediently direct route, but there are other avenues to the BVI as well. Flights may be taken to San Juan, Puerto Rico or St. Thomas in the U.S. Virgin Islands in order to connect to

BVI: Britain's Enchanted Caribbean



Divers visiting the British Virgin Islands have several choices of vacation including: land based resort hotel, live-aboard motor or sailing cruises, chartered bareboat or crewed vessel. A number of professional dive services will rendezvous with charter vessels. Top: A diver and trumpetfish at Rhone Reef. Left: Snorkeling at The Baths. Below: Fishwatching on the Rhone. Right: A porcupinefish at night on the Rhone.



Beef Island. San Juan is one of the major hubs of the Caribbean and many major carriers from numerous U.S. gateway cities offer direct service to it. St. Thomas is likewise well connected with air service from major carriers. Air BVI, Eastern Metro Air Link or Crown Air are examples of connecting carriers into the BVI. It is also possible, and quite practical, to connect with a ferry—such as Speedy's Fantasy in St. Thomas—for a comfortably scenic boat ride to Tortola or Virgin Gorda. The ferry service is much more forgiving on overweight baggage than an airline can be, so for U/W photographers traveling with numerous camera cases, it is an especially realistic option.

The British Virgin Islands are, for the

most part, volcanic in origin. The exposed islands are the verdant tips of an ancient mountain range and the same convoluted formations so beautifully evident topside are colorfully coral encrusted beneath the sea. Anegada is the chief exception to the hilly profile of the BVI; it is a flat coral and limestone atoll. These islands fall within the trade wind belt that not only contributes to the balmy, subtropical climate, but also creates the conditions favorable to some of the world's most consistently fine sailing. With so many scenic anchorages, secluded beaches, excellent dive and snorkel opportunities and topside support for both motor and sailboats, the BVI is without peer as a cruising capital.

The air temperatures are most agreeable, usually within a range of 77 to 85°F in the winter and about 80 to 90°F in the summer. Nighttime temperatures may drop ten degrees. The water temperatures range from a low 74°F in the winter to 84°F in the summer. Lateral visibility can often exceed 120 feet in the flat calm of summer or drop to as low as 40 feet with a winter squall. The islands vary in rainfall, soil and wind exposure and consequently host a wide variety of vegetation. Palm trees and mangoes compete with hibiscus and bougainvillea in the moister areas, while mangrove and sea-grape line the shores and cactus, frangipani and wild tamarind adorn the more arid hillsides. During a rainy season the

Islands

TEXT AND PHOTOGRAPHY
BY STEPHEN FRINK



With agreeable air and water temperatures year-round, the British Virgin Islands offer a wealth of soul satisfying scenery including emerald green mountains jutting up from aquamarine water; white sailboats anchored in quiet bays; and quaint towns clinging to hillsides. Left: The *Chikuzen*. Above: Tortola. Below: The Bitter End Yacht Club.



hillsides appear absolutely lush and green, while in the temporary droughts the vegetation takes on a brownish hue. Travelers may also wish to note that the language is English, the U.S. dollar is a commonly accepted currency and the electric service is 110 volts, 60 cycles.

Entry requirement to the BVI is a valid passport, but for U.S. and Canadian citizens, a voter's registration card or birth certificate is adequate.

Diving services in the British Virgin Islands are most complete and quite flexible. Vacationers have the option of diving from a land based resort hotel, joining a live-aboard sail or motor cruiser or chartering a bareboat or crewed vessel that may or may not have a compressor on board. If there is no compressor, there are a number of air fill stations throughout the islands, as well as a number of quite professional "rendezvous" diving services, a concept we will explore in greater depth later in this article. The dive operators have evolved a system of services compatible with the vast marine resources and the specific demands of their clientele. Whether from a land or a boat base they provide services in a very professional manner.

RESORT BASED DIVE TOURS

If your desire is to check into a hotel for a land base of operations with daily dive tours, the BVI has plenty of options. On Tortola, for example, there are 17 hotels and more than 20 guest houses. The three major diving services will happily serve guests from any of the resorts. However, there are only a few resorts that specifically target traveling divers as their preferred clientele and have structured dive/lodging packages. Examples of these sorts of properties include the Moorings Mariner Inn, the Prospect Reef Resort and the Treasure Isle Hotel.

The MOORINGS MARINER INN offers a combination of hotel accommodations in 36 double rooms, each with a refrigerator, hot plate and two suites, as well as an extensive marina and an incredible fleet of sailboats. At present the Moorings fleet consists of five, 60 foot and two, 51 foot fully crewed sailboats and 90 bareboat or crewed charter boats of either 37, 43 or 51 feet. The hotel also features a restaurant and lounge, gift store, marine supply facility and the dockside dive shop/boutique of Underwater Safaris.

The Moorings evolved from the basic love of sailing maintained for 45 years by owners Ginny and Charlie Cary. Having sailed enough in the Caribbean on other

people's bareboats and formulating an idea of how they'd like to do it better, the Carys sailed six Pearson 35s into Roadtown Harbor (Tortola) in 1969 to start the first bareboat charter operation in the British Virgin Islands. The business has grown quite considerably and now has bases in St. Lucia to serve the Grenadines and in the Pacific in the Kingdom of Tonga and the Leeward Islands of Tahiti.

Since many sailors are also divers, the Moorings collaborates with UNDERWATER SAFARIS, owned by Bob and Gail Stafford, to provide diving services for both their hotel guests and the charter clientele. Underwater Safaris has been at the same location for seven years, but the services offered and the physical plant have steadily expanded and improved over that time. At present there is the dockside boutique of approximately 1,000 square feet, devoted to T-shirts, leisure wear, post cards, snorkel and scuba gear and some underwater camera rentals and accessories. In addition, there are compressors, tank and rental gear storage areas and, of course, dockage for the fleet of dive boats. All diesel powered deep-V configured hulls, the dive fleet consists of the 42 foot Thomas known as *Mako*, a 26 foot Stapleton called *Underwater Safaris I* and a new 30 foot Island Hopper *Rendezvous II*. Each vessel is equipped with tank racks, walk-through transoms, dive platforms with extended ladders and VHF radio.

The Underwater Safaris dive business caters to hotel guests of the Moorings and other hotels in the Tortola area, but also has a very complete rendezvous service. For example, they will communicate with the bareboat and crewed charter boats via VHF and deliver diving services to any boat within a range that basically includes Norman, Salt, Ginger, Peter, Deadchest and Cooper Islands. These services include scuba instruction (with more than 1,500 resort courses and 300 full certifications last year), delivering scuba cylinders and providing boat diving services and scuba equipment rental. They will meet people at their boats for a two tank morning dive, a one tank afternoon dive or even a night dive. This is an especially useful service for charter groups with a mix of divers and nondivers. With rendezvous services the divers from the group can arrange to be picked up at an anchorage while the sailing contingent might cruise to another part of the BVI. The rendezvous operator will then return the divers to the new anchorage. Underwater Safaris also maintains air fill stations (besides the main facility at the Moorings) at Cooper Island and Cane Garden Bay. In the Tortola area Aquatic Centres and Blue Water Divers also specialize in rendezvous diving services, while in the area of Virgin Gorda, Dive BVI and Kilbride's Underwater Tours are the rendezvous experts.

AQUATIC CENTRES provides diving services for both the Prospect Reef and

Treasure Isle Hotels on Tortola. Under new ownership, the Aquatic Centres are now operated by Alan Baskin and Eva Cope, formerly of Baskin in the Sun fame in Haiti. Given their nine years of experience in Haiti, three years in the Dominican Republic and three years in Grenada—and the core of excellent divemasters and instructors such as Randy Keil, who have remained a part of the new Aquatic Centres team—the management transition has proceeded smoothly.

Aquatic Centres is comprised of two retail facilities, one at the Prospect Reef Resort and one at the Treasure Isle jetty. Generally there are dive boats kept moored at each location and there are compressors at each.

The Prospect Reef facility maintains one 20 cfm and one 16 cfm compressor and a seven cfm system is in place at Treasure Isle jetty. The dive boats include the *Narcosis II*, a 35 foot turbocharged diesel V-hull designed to accommodate 14 divers, and the *Apache*, a 30 foot turbo diesel Island Hopper V-hull for 10 div-

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ers. Both boats are especially designed for diver comfort and convenience with tank racks, platform and extended dive ladders, walk-through transom, freshwater shower, stereo and marine electronics. There are also plans to bring a third boat from the Haiti operation—a 25 foot Rampone powered by twin 150 hp outboards for small groups of specialty divers. Note also that both dive centers include guest storage areas so that only cameras need to be carried from the hotel rooms to the boats. With Aquatic Centres, as with most of the dive operators in the BVI, there is a high level of personalized service to the traveling diver. For example, the guest will never have to carry his/her own tank, or in many cases even set up the gear unless it is the diver's personal preference.

Diver instruction is an important adjunct to the Aquatic Centres programs and both PADI and NAUI certifications are available. Instruction from resort course through assistant instructor may be scheduled and specialties include deep diver, equipment specialist, under-

water photographer and wreck diver. The safe handling of marine life is another popular facet of the guided dives.

The TREASURE ISLE HOTEL, managed by Peter Wimbush, is a comfortable 40 room affair on a scenic bluff overlooking Road Town Harbor. Each room is a double with either a king, queen or two single beds; all rooms are air-conditioned and have telephones. There is a freshwater swimming pool, big screen TV with cable and VCR, a restaurant and lounge and a poolside bar and gift shop. The Treasure Isle features year-round package diver rates and also encourages repeat business by offering two nights free with the next week's booking (the offer is transferable to family or friends).

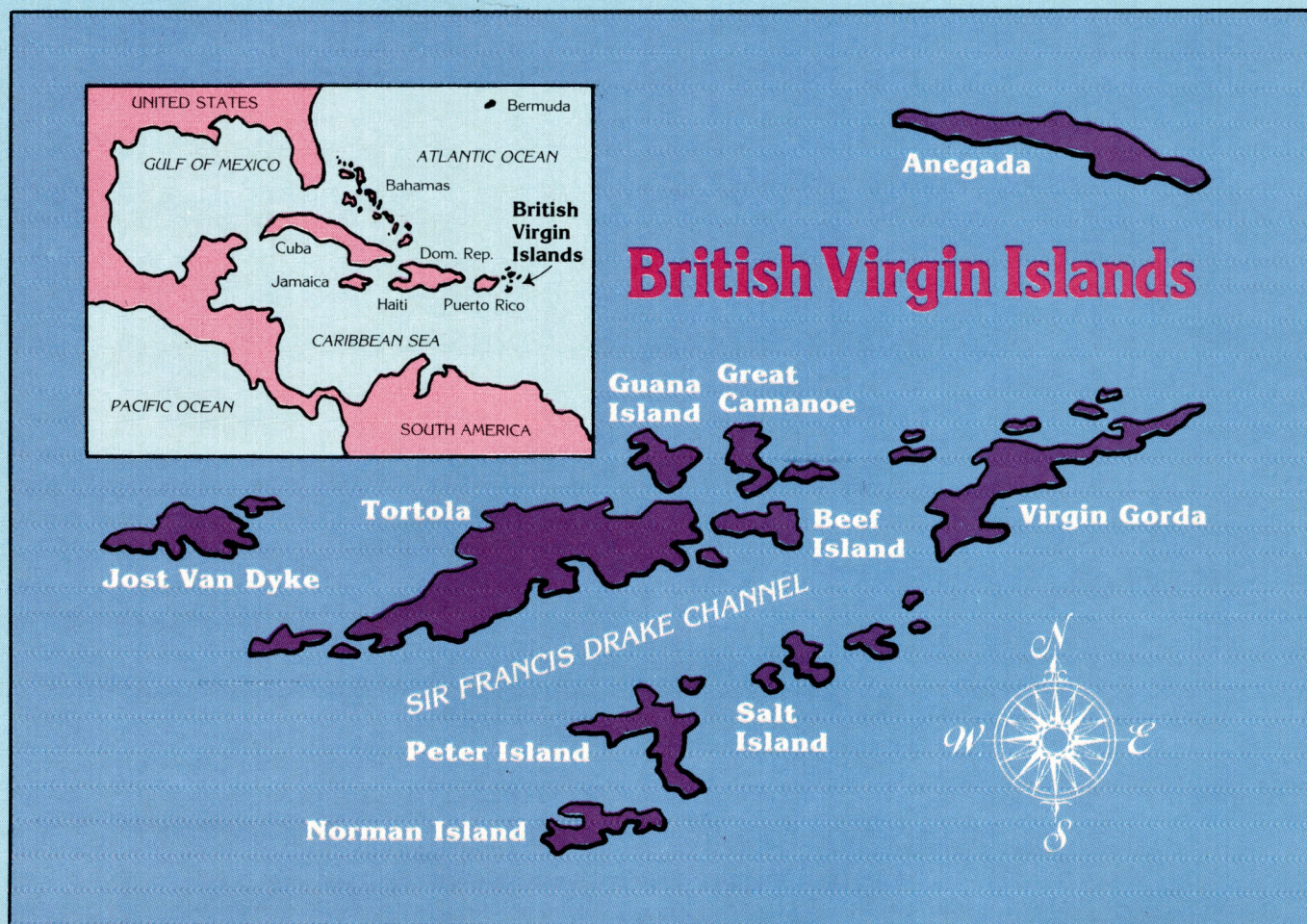
The PROSPECT REEF RESORT is a huge 131 unit complex managed by Graham Sedgwick. The majority of the accommodations are suites, 79 having kitchenettes and the remaining hotel rooms of various configuration. A very activities oriented resort, the Prospect Reef offers on-premises diving and snorkeling (with Aquatic Centres), sportfishing, six tennis courts, a gymnasium with Universal machines, charter sailboats and power boats, swimming pools, conference center, gift and grocery shops, a photography concession and even a hairdresser. The entire complex is 14 acres along the ironshore with good snorkeling and intro scuba areas just offshore. There is an en-

closed and protected series of sea pools that serve very well for scuba instruction.

BLUE WATER DIVERS is based at the Nanny Cay marina. Operated by Michael Royle, Blue Water Divers maintains a 27 foot commercial work boat, the *Blue Runner* and a 30 foot custom deep-V dive boat called *Akadba* for diving, as well as a retail facility and a 17 cfm compressor. Servicing primarily the walk-in trade from the marina, Windjammer cruises and some package business with the Sugar-mill, Sebastians or Casa Maria hotels, Blue Water Divers offers a range of dive sites from Norman to Ginger Islands.

Among the specialty services available in Tortola are those catering to the underwater photographer. CARIBBEAN IMAGES, under the direction of Dave Mansfield, processes E-6 compatible films, rents and sells underwater still cameras and accessories, teaches video and still underwater photography and produces custom underwater videos.

While Tortola is the largest and most populated land mass in the BVI, Virgin Gorda is one of the favorite destinations for yachtsmen and also the home for a number of superior resort properties. Virgin Gorda (the fat virgin) was named by Columbus during his voyage of discovery and presently has a population of about 1,200. The terrain is quite varied with the northern half of the island mountainous and a peak elevation of 1,370 feet. The



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Alan Baskin's
AQUATIC CENTRES
Tortola - British Virgin Islands

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southern half is flat and sprinkled with beautiful beaches and giant boulders providing surreal relief. **The Baths** are the most famous congregation of these giant rock formations. Haphazardly jumbled amid an exquisite sandy beach, The Baths form dimly lit sea caves and a picturesque anchorage.

KILBRIDES UNDERWATER TOURS and DIVE BVI are based in Virgin Gorda and provide rendezvous and resort diving services. Kilbrides Underwater Tours has a compressor at the Bitter End Yacht Club but all the dive equipment is typically carried aboard the *Shah*, their floating dive shop. The diesel powered *Shah* is a deltaville deadrise, a hull design popular in the Chesapeake Bay as a crabber. There is plenty of room for guests aft and ample gear storage forward. Operated by Bert and Gary Kilbride, Kilbrides Underwater Tours has provided 23 years of continuous diver service in the BVI and at present employs three generations of this famous diving family.

Basically, Kilbrides will pick up guests from any of the North Sound hotels, but most of the business seems to derive from the BITTER END YACHT CLUB, LITTLE DIX BAY HOTEL, TRADEWINDS RESORT or through their packages with DRAKE'S ANCHORAGE.

DIVE BVI is operated by Joe Giacinto and Ken and Barbara McDonnell from a base at the Virgin Gorda Yacht Harbor. They maintain a very well stocked retail store for dive gear, T-shirts, post cards, island leisure wear, etc. There is a 17 cfm Mako compressor for air fills and boat diving is done from a 38 foot Bruno and Stillman deep-V diesel equipped vessel with flybridge, tank racks, walk-through transom, VHF and dive platform at water level. Their dive cruising range runs from the north side of Tortola to Norman Island, as well as numerous sites around Virgin Gorda. Both Kilbrides and Dive BVI have access to a tremendous variety of diving. Hotel packages with Dive BVI may be arranged with LEVERICK BAY RESORT, GUAVABERRY SPRINGS, the OLDE YARD INN, FISCHER'S COVE BEACH HOTEL, the OCEAN VIEW HOTEL and the DIAMOND BEACH CLUB. During our brief visit to Virgin Gorda we were able to sample the hospitality of the Bitter End Yacht Club, Tradewinds Resort and Leverick Bay Resort, and while distinctly different and unique properties, all were comfortable, scenic, upscale resorts.

LIVE-ABOARD DIVE TOURS

It is unlikely that any destination in the world offers as many live-aboard dive options as are available in the British Virgin

Islands. There are several vessels that allow you to individually book onto a scheduled charter, others that cater to small dive groups in private charter and virtually any charter boat may be serviced for diving by the rendezvous dive operators of the BVI.

The *TROPIC BIRD* was originally constructed as a German E-boat, worked as a treasure hunter in the Bahamas for eight years, and for the past six years has been the floating hotel for groups of enthusiastic divers. Captained by Mike Bloss, himself one of the most active and enthusiastic divers in the business today, the 98 foot long *Tropic Bird* is powered

by twin diesels. It is air-conditioned, offers 24 hour electric service of 110 volts 60 cycles, has stereo piped to public areas, VHS and Beta videos, two inflatable chase boats, a Sunfish, two Tekna scooters (available at no charge to guests), full dive gear for up to the full complement of 24 passengers and a huge dive platform. Its two Mako K14 compressors pump the 42 aluminum cylinders on board to 2,800 psi. The *Tropic Bird* cruise is structured as a maxi-dive adventure. Those who wish may make up to seven dives per day, although the average clientele makes more like five per day. The diving begins at 7:00 am and

BVI HOTELS AND RESORTS

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(809) 494-2741

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(809) 494-2595

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(809) 495-2518

Moorings Mariner Inn

P.O. Box 139
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(809) 494-2332

Prospect Reef Resort

P.O. Box 104
Road Town, Tortola, BVI
(809) 494-3311

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(809) 494-2483

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(809) 495-4234

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East End, Tortola, BVI
(809) 495-2477

Treasure Isle Hotel

P.O. Box 68
Road Town, Tortola, BVI
(809) 494-2501

Village Cay Marina

P.O. Box 145
Road Town, Tortola, BVI
(809) 494-2771

VIRGIN GORDA

Biras Creek Hotel

P.O. Box 54
Virgin Gorda, BVI
(809) 495-5455

Bitter End Yacht Club

P.O. Box 46
North Sound, Virgin Gorda, BVI
(809) 494-2746

Diamond Beach Club

P.O. Box 69
Virgin Gorda, BVI
(809) 495-5452

Fischers Cove Beach Hotel

P.O. Box 60
The Valley, Virgin Gorda, BVI
(809) 495-5252

Guavaberry Spring Bay

P.O. Box 20
Virgin Gorda, BVI
(809) 495-5227

Leverick Bay Hotel

P.O. Box 63
Virgin Gorda, BVI
(809) 495-5450

Little Dix Bay Hotel

P.O. Box 70
Virgin Gorda, BVI
(809) 495-5555

Ocean View Hotel

P.O. Box 66
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(809) 495-5544

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P.O. Box 64
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(809) 494-3151

OTHER ISLANDS

Anegada Reefs Hotel

Anegada, BVI
(809) 494-3425
(Marine Radio Operator)

Drake's Anchorage

(Mosquito Island)
P.O. Box 2510
Virgin Gorda, BVI
(809) 494-2254

Guana Island Club

P.O. Box 32
Road Town, Tortola, BVI
(809) 494-2345/U.S. (914) 967-6050

Marina Cay Hotel

P.O. Box 76
Road Town, Tortola, BVI
(809) 494-2174

Peter Island Hotel and

Yacht Harbour
P.O. Box 211
Road Town, Tortola, BVI
(809) 494-2561

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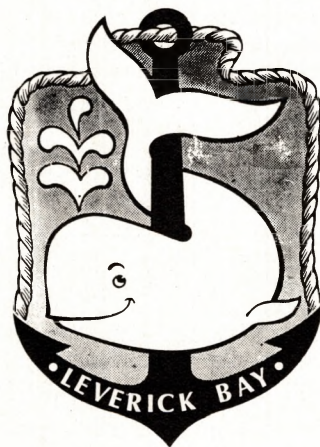
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Blue Water Divers
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(809) 494-2847

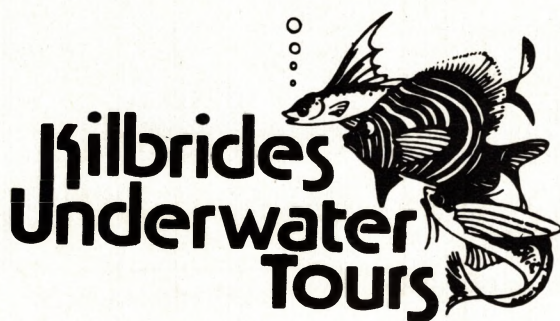
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tains near the Muirhead ancestral home in Scotland, both vessels are trimarans and feature courteous, competent crews, excellent food and a dedication to providing the best available diving adventures. *Lammer Law* is unique, if only for her size (92 feet in length with a beam of 42 feet). There is a 500 square foot main saloon, 2,500 square feet of sundeck and nine luxurious staterooms the size of a small hotel room complete with a private bathroom with shower, head and washbasin. Austere she is not. When not under sail, power is provided by twin 210 hp diesels. Electric service (110 volt) is provided by two 40 kw generators, and two electric compressors handle the air fills.

The *Misty Law* is 56 feet long with a 26 foot beam and is powered by two 75 hp diesels that permit her to motor at about eight knots. She will generally sail at about the same speed under normal wind conditions. The *Misty Law* will accommodate eight guests in four double cabins. A typical dive itinerary might include Norman Island, Peter Island, Salt Island, Cooper Island, The Dogs and Virgin Gorda but the specific range will be determined by the weather patterns and the guest's desires. Captain Tim Fox, first mate Cele McLachlan and chef/divemaster Davide Pugliese are all avid divers and they can provide their guests with two to three dives per day structured around the sailing, beachcombing, dining and relaxation that are integral parts of the *Lammer Law/Misty Law* experience.

There are a number of other vessels in charter that can cater to smaller groups of live-aboard divers. For example, *Trespasser* is a new addition to the Trimarine fleet. She is a 48 foot trimaran set up to accommodate six in three cabins with two heads and two showers on board,

and a crew of two. There is a compressor and the concept of the *Trespasser* charter, as with *Lammer Law* and *Misty Law* is "all inclusive." All food, drinks, diving, watersports, etc. are included. The only additional costs are the tourist tax, airport transfers and gratuities. Note that gratuities on live-aboard boats are very much in good form. An approximate guideline is ten percent of the charter fee per person, which is then generally divided equally among the crew.

Another interesting dive/sail adventure may be found aboard *PPALU* (pronounced Päh loo, Polynesian for "navigator"). At 75 feet long and 28 feet wide she is reputed to be the largest cruising catamaran in the world, but her primary claim to fame is her speed, for *Ppalu* has sailed as fast as 30 knots. Her average speed on charter is more like 15 to 22 knots, but there is no question she is fast, elegant and well suited to the diving interests of the crew and guests.

LA BUSCADORA is a 74 foot luxury motor yacht refurbished to accommodate four guests in deluxe double staterooms with en suite head and shower. The vessel is fully air-conditioned and features stereo, video, superior dining courtesy of chef Bonnie, and is an absolutely beautiful charter experience. We joined *La Buscadora* for too short a cruise last summer and found it not only relaxing but the key to wonderful diving opportunities. Captain Russ Skidmore is a dive instructor and enjoys showing his guests his favorite hot spots. The vessel is equipped with a compressor, large dive platform and a 20 foot V-hull chase boat.

JULIA B is another exquisitely crafted vessel, a 49 foot sailing yacht built in Sweden in 1984. Captain Dieter Scholz was a dive instructor for Underwater Safaris and has 20 years of dive experience. First mate and gourmet chef Martina Kircher collaborates to provide a highly personalized luxury dive/sail charter. The *PROMENADE* is another example of a dive/sail trimaran for up to 10 guests in five double cabins.

As you may surmise, the quality and

variety of this fleet of live-aboard dive boats and charter yachts is most impressive. And, this does not even begin to cover the potential for bareboat charter from the Moorings, CARIBBEAN SAILING YACHTS, STEVENS YACHTS, NORTH SOUTH YACHT CHARTERS, the BITTER END YACHT CLUB or any of a dozen other charter firms. If it has to do with boats, you'll find it in the British Virgin Islands.

With such an extensive infrastructure to provide services for the visiting diver, it is fair to assume there must be an attractive underwater natural resource, which is absolutely the case in the BVI. A brief overview of some of the British Virgin Islands dive highlights would have to include the **RMS Rhone**. Smashed against the reef and rocks off Salt Island by a violent hurricane in 1867, the *Rhone* was a 310 foot long Royal Mail Steamer. Her sense of historical authenticity combines with her incredible propensity for attracting fish life and makes this not only one of the premiere dives of the BVI, but probably

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part of the Caribbean top ten. The bow section lies semi-intact on its starboard side in 80 feet of water, with the mid section and the stern in approximately 65 and 30 feet respectively. As beautiful as the *Rhone* day dive is, the night dive on it is a magical experience that should be a part of your BVI dive vacation.

Rhone Reef, directly adjacent to the wreck, lies in 5 to 50 feet of water and is typified by scattered high profile coral heads and huge boulders. Caves and undercut ledges house massive schools of copper sweepers and glass minnows and a resident green moray eel and nurse shark liven the photo potential. Because of its proximity to the wreck, Rhone Reef is not dived too often, but it is an amazingly pretty dive and one that offers considerable photo potential.

Blonde Rocks is named for the mass of fire coral that encrusts the top of the reef, but also features a fairly vertical reef face from 30 to 65 feet that is undercut with ledges and caves. While the reef is quite expansive, I did not move 50 yards down it before I had shot three rolls of film. One of the most fascinating photo subjects is the schools of blackbar soldierfish in the caves.

The **Chikuzen** is another potentially spectacular dive. A 246 foot steel hulled refrigerator ship, formerly used in the long line fishing trade, caught fire and drifted from St. Martin aflame before sinking in 75 feet of water in the Sir Francis Drake Channel. She lies on her port side on a sandy bottom and almost immediately after she sank in September 1981, the ship began to attract both reef and pelagic life. It now hosts schools of barracuda, amberjack and horse-eye jacks, grunts, snapper, spadefish, eagle rays, stingrays and even an occasional shark.

The **Chimney** is a dive site on the west side of Great Dog named for a reef structure resembling a mountain climbing chimney, not a smokestack. With a maximum depth of 42 feet, this has been a fish feeding reef for years and, as a result, the reef tropicals, stingrays and the pet viper and spotted morays the Kilbrides have been training are quite approachable.

Painted Walls is typical of the areas with incredible sponge and cup coral encrustation. You see bits of the same at Rhone Reef, at the **Invisibles**, Blonde Rocks, the Chimney, **Deadchest** and many other dive sites and it is a phenom-

CAMPGROUNDS

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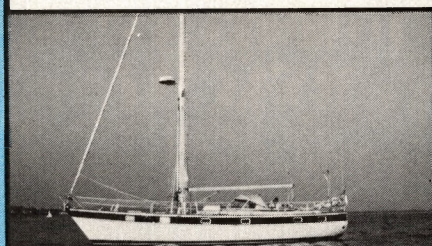
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BVI

enon I associate more with the British Virgin Islands than anywhere else in the Caribbean. The encrustation is so thick, and the macro subjects so prolific, that Painted Walls merits repeat dives.

Another of my personal favorites is

PERTINENT FACTS

excerpted from/The Welcome, BVI Tourist Guide

VISITORS

Visitors are welcome for a period of up to six months, provided they possess return (or ongoing) tickets, evidence of financial support and pre-arranged accommodations during their stay.

A passport is the principal requirement for entry into the British Virgin Islands, nonetheless, in the case of United States and Canadian citizens, an authenticated birth certificate, a citizenship certificate or a voter's registration card are sufficient. Visitors from some countries may also need a visa: if in doubt about this, contact the Chief Immigration Officer, Government of the British Virgin Islands, Road Town, Tortola, BVI; (809) 494-3701/3471.

FOOD AND LIQUOR

While there is no restriction on the quantities of food or liquor brought into the islands by visitors for their own use, all imports are subject to varying rates of duty. Imports entering the BVI, not on a permanent basis, will not be subject to duty, i.e., automobiles, stereo equipment, etc. In the case of liquor, prices in the BVI are so low that—even with duty added—savings can be made by purchasing here.

MEDICAL

An International Vaccination Certificate is not mandatory in the BVI. There is a hospital with X-ray and laboratory facilities. Eight doctors practice in Tortola along with two dentists and two visiting eye specialists. On Virgin Gorda, there is one doctor. On Tortola, there is also a small private hospital specializing in plastic surgery.

PETS

Visitors or returning residents with pets should note that permits from a local authority and health certificates from registered veterinarians are necessary. Write well in advance to the Chief Agricultural Officer, Road Town, Tortola, BVI. Pets will not be admitted without prior clearance.

CURRENCY

The currency of the BVI is the U.S. dollar. American Express, Visa, Diners Club and MasterCard are accepted in many establishments. To avoid embarrassment please do not try to make payments with personal checks.

DRIVING

A valid BVI driver's license is required by all persons wishing to drive in the BVI.

Ring-Dove Rock. I dove there for the first time with Mike Bloss of the *Tropic Bird* four years ago and while I remembered how much I enjoyed the dive, I couldn't remember the name of the site. This year Mike arranged another trip to Ring-Dove and it was as I remembered—a coral pinnacle just barely awash at low tide with columns of pillar coral in clusters, schools of brightly colored tropicals and all manner of eels. There was a voracious school of reef butterflyfish harassing a lone sergeant major trying to protect its egg mass, a beautiful gold

For a fee of \$5, a temporary license can be obtained from police headquarters or car rental agencies, provided a valid driver's license from another country can be produced. It is also important to remember that driving is on the left hand side of the road. The maximum speed limit is 30 miles per hour. In residential areas, the limit is 10 to 15 miles per hour. All bicycles must be registered at the Traffic Licensing Office in Road Town. Cost of registration is \$5. The license plate must be fixed to the bicycle.

MARRIAGE LICENSES AND REGULATIONS IN THE BVI

You are required to be in the Territory three days before you can be married. You then apply for an application form at the Attorney General's Chambers on Main Street, Road Town. You must take two people with you to witness the receipt of the license.

After receiving the license, you go to the Registrar's Office on Wickham's Cay I, near the Sports Field. The office hours are: Monday through Friday 9:00 am to 6:00 pm and on Saturday 9:00 am to 12 noon. The Registrar's Office will require the following information:

- (a) The names and ages of the two parties involved.
- (b) The names of the two witnesses.
- (c) The occupations of both parties.

You can then get married either in a church of your choice or arrange for the registrar to marry you. The fee is \$10 if you are married by the registrar. Please travel with proof of your identity, such as passports, birth certificates and certified copies of your marital status. Blood tests are not necessary.

If you require any other details, please write to: Registrar's Office, P.O. Box 418, Road Town, Tortola, BVI or phone (809) 494-3701/3492 ext. 303/304.

HOTEL ACCOMMODATION TAX

In the BVI there is a seven percent hotel accommodation tax, payable by each guest at the end of a visit. This tax is always included on the hotel bill.

DEPARTURE TAX

A departure tax is levied at the rate of \$5 per person leaving by air and \$3 per person leaving by sea.

A WORD ON DRUGS

The possession, sale, use or distribution of drugs constitute criminal offenses punishable by law and conviction on drug charges can lead to stiff fines and jail sentences.

spotted moray in a cluster of pillar coral, a huge lobster and a cooperative, photogenic queen angel. The plan was to circumnavigate the pinnacle, but I got distracted with the wealth of photo subjects.

I know there were many dive sites I was unable to sample. I didn't get to dive the caves of **Guana Island** with their schools of glass minnows and copper sweepers, juvenile spotted drums and baby lobsters. Nor did I dive the **Seal Dogs** to experience the pelagic parade of blackfin tuna, wahoo, eagle rays and blacktip sharks. **Alice in Wonderland** on the south side of Ginger Island is reportedly good for beautiful coral formations, grouper and sighting reef sharks. Most disappointing of all was to not be there to photograph the mother and calf humpback whale lolling outside the entrance to the Virgin Gorda Yacht Harbor during the annual whale breeding season. There are so many islands with so much dive potential on both windward and leeward shores that rarely is a day lost to weather in the BVI and never is one lost to boredom. Obviously, much more than a week is necessary to sample them all: Perhaps that is why so many divers return year after year. 🐠

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Ontario M3B 1X7
(416) 443-1859

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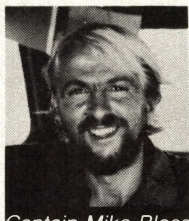
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Captain Mike Bloss

Hi, it's me again.

They told me I had to sit down and rite another letter. I'm a diver, not an ad riter. I gave it my best shot last time in September 1985 SKIN DIVER, and now I'm supposed to improve on perfection.

I asked my loyal and faithful crew for help. After they got through with such fancy words as "wow", "Fabulous", "warm gin clear water", they started on slogans such as "Make the "Bird" your nest in the Caribbean", "Give your buddy the "Bird" for Christmas", along with some very funny but unprintable ideas. As you can see they were a big help. I'm going to have them stick to what they do best -- giving our guests a good time.

You who have been here before know what we are all about: good diving and good fun! Why, sometimes we throw parties for no reason at all. We have some new toys. Tekna scooters for one, and over fifty Beta Max movies (or you can bring your own).

We also have a really nice video presentation about the "Bird". Call us if you want to show it at a club or shop meeting. It's not as good as being here, but it's fun.

For you who haven't been here yet, lets talk about live aboard dive boats and dispel some of your worries. Most of you are concerned with privacy, boat motion, and food. We have twelve double staterooms, no bunk rooms, two large indoor lounge areas, a sun deck, and a covered after deck. If you don't want to talk to anyone or listen to my jokes, you can hide out with no trouble. As for boat motion, we are always in calm waters, never out in the big waves. The British Virgin Islands is one of the nicest places in the world for boating, plus "Tropic Bird" is so big and steady that it can't be compared with the little boats you have been on. The food is plentiful and good, and you don't live on what you shoot. Three meals a day, turkey, ham, beef, chicken, and fish - good normal things, well prepared and served buffet style, all you can eat. Don't plan on losing weight during your trip.

It's the same old story -- lots of no-muss no-fuss diving, great food and good company.

I've done my best. C'mon down and visit us in Paradise and get wet. Any one who likes to rite ads please come. I need help!

(Is my speling getting better?)

Mike

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FARNSWORTH BANK

U/W Mountain Behind California's Catalina Island Offers Excitement For The Experienced

TEXT AND PHOTOGRAPHY BY DARREN R. DOUGLASS

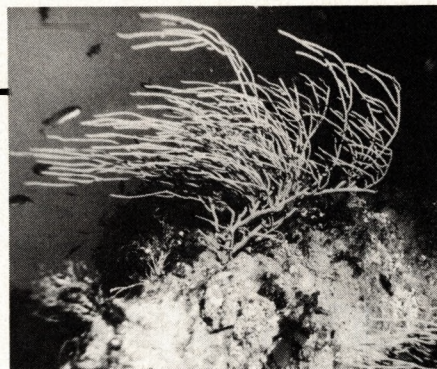
Approximately two miles off Ben Weston Point on the backside of Catalina Island lies an underwater mountain. A high spot rising from the seafloor, it comes to within 60 feet of the surface. Its sides are vertical walls, with crevices and canyons that descend rapidly toward abyssal depths.

Sheets of *Corynactis* anemones adorn the sides of walls along with pink, orange, yellow and golden gorgonians. Scallops and lobster inhabit the area. California hydrocoral, which looks like miniature tropical staghorn coral, sends forth its splendid hues of light blue, purple and pink. These colonies literally cover the bottom at greater depths.

For the experienced diver, the Farnsworth waters yield a treasure of underwater opportunities. For the photographer, subject possibilities are overwhelming. There is an abundance of invertebrate life, while the pelagic-blue water brings a clarity and contrast to wide angle work. Underwater hunters find Farn-

sworth a good area for large calico bass and sheephead, as well as yellowtail, white seabass and rockfish. Spearfishing at depth however, requires special planning owing to the greater air consumption that occurs there. There are restrictions to hunting and collecting at Farnsworth. The hydrocoral may not be collected. Spearfishing, however, is permitted.

Owing to its depth, Farnsworth Bank is a dive for the experienced only. Exacting preparation and the following of a dive plan are required to ensure success and safety. A good rolling swell can cause the boat's anchor to become uprooted. Pinnacle divers have, on occasion, witnessed an anchor flying past their heads, across the reef and off into the great blue beyond like a phantom jet. At the greater depths, narcosis can multiply the gravity of any error. Depth and bottom time limitations must be adhered to stringently. Air consumption needs to be monitored much more frequently. Farnsworth Bank is, however, a safe and enjoyable dive for



A gorgonian coral on a rocky outcrop at Farnsworth Bank. In this location it feeds on plankton suspended in the currents.

advanced and experienced individuals.

Because it's so far offshore, Farnsworth Bank is accessible by boat only. Many dive shops and clubs use charter boats to visit Farnsworth each year, so it is not difficult to make a dive there if you lack your own personal dive boat.

If you are an experienced diver who is comfortable in deeper water; if you are at home in a variety of conditions; if you have been seeking a little bit of change and diversity in your Southern California diving experience—Farnsworth Bank should be on top of your next list of diving destinations. Enjoy some of that deep blue water, the beautiful hydrocoral and the abundant marine life. Make a drop down on the Bank: Farnsworth Bank.

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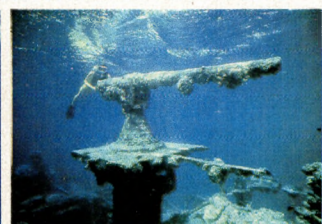
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FLORIDA'S Freshwater Springs

PHOTO BY STEVE LUCAS: GINNIE SPRINGS

**TEXT AND PHOTOGRAPHY
BY STEVE LUCAS**

There is one question most often asked about a dive destination: What's the U/W visibility? As divers, this is our common passion—our obsession. We want to be able to see well beyond anything we can touch or photograph.

But, there always seems to be a limit, a maximum range beyond which lies a realm of pure fantasy, improbability and impossibility. One hundred feet seems to have been given our universal nod of approval. If the visibility is within 20 feet of that distance, it will be declared "100 feet" and everyone in the water is ecstatic. One hundred fifty feet is incredible and few ever expect to experience 200 feet. Any storyteller who claims visibility beyond that impossible distance is subject to disbelief and skepticism. Three hundred feet? Sorry, most people won't even ponder its existence—until they swim through the cloudless liquid of Florida's clearest freshwater springs.

The Rainbow River, the Ichetucknee River, Ginnee Springs, Troy Springs and a dozen more just like them: These places set our standards for water clarity. They don't have the dazzling colors of Bonaire or Cozumel or the Indian Ocean. Their hues are more subdued and tend toward the greens of the aquatic plants that cover their sandy floors. There are no angelfish or grouper, no seafans or corals. Instead, there is rushing water, spectacular cavern overhangs, largemouth bass, colorful sunfish, artifacts and, in places like King's Spring, a very special species of big animal you are unlikely to swim with anywhere else. And, best of all, there is no salt. If you rinse your camera and regulator after coming out of these waters you are probably doing more harm than good. Few other places in North America have water so naturally pure it is drinkable at the source.

Created by a natural geological phenomenon known formally as the Ocala Uplift, north and central Florida have an underground honeycomb of flowing waters that break through the surface to feed the state's rivers. The natural pressure of ground water as far away as Georgia and Tennessee drives through the underground systems carved deep in the limestone beds. As this water strikes the uplift it is forced toward the surface. On the way up, thousands of tiny streams join to create underground rivulets, then rivers that sometimes flow several miles before finally being forced out of the ground. The natural process of filtration through porous rock clarifies the water to a point almost never seen in the ocean.

Concentrated west of I-75—which runs from the state's northern border to meet the Florida turnpike in the center of the state—then south to Tampa, the springs are passed daily by thousands of divers on their way to almost all of the state's

The Sunshine State's Inland Ocean



North and central Florida have an underground honeycomb of flowing waters that break through the surface to feed the state's rivers. Top: A diver explores Royal Spring. Above: Canoeing at Devil's Eye Spring (note the dark blue in foreground). Left: Visitors to Homosassa Springs' Animal World watch fish in the Fish Bowl.

other popular dive destinations. Also concentrated in this region are the majority of the most popular family vacation areas in the United States: Walt Disney World, Epcot Center, Sea World and Circus World. Many other attractions have built their themes and shows to take advantage of the natural beauty of the springs: Silver Springs, where almost all the original Tarzan films and Sea Hunt television episodes were made; Weeki Wachee, the city of living mermaids; and Homosassa Springs Animal World, where you walk underwater in a submerged aquarium to be viewed by the fish. Combined with so many family attractions, the springs make a perfect location to spend that extra vacation week.

The best known of all the state's springs are those concentrated at Crystal River. On U.S. 19 near the Gulf of Mexico, the city is approximately halfway between Gainesville and Tampa. The area has just the right number of dive operators to service the crowds that seek the springs each weekend. On weekdays you may find yourself almost alone. Some operations specialize in personal tours of the major springs such as King's and others within a two hour drive of the city. Others will rent you a johnboat, fill your tanks and furnish you with a map of the area so you can explore on your own.

Having recovered from the hurricane season of 1985, which caused saltwater intrusion that destroyed much of the aquatic plants and reduced visibility to the lowest in recent memory, the Crystal River springs' clarity have returned to normal levels. Although still not the clearest in the state, the principal drawing power of Crystal River is its resident winter population of manatees. Between November and April this endangered species seeks the abundant food and warmth of the consistent 72°F water found in all of Florida's clear springs.

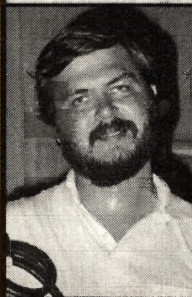
The manatee is a slow moving mammal that often swims just beneath the surface. Even though numerous warning signs are posted during the season, cautioning boaters to run at minimal speeds, there are always those who feel it is their right to run as fast as their boats can travel. The resulting injury to the manatee normally does not cause its instant death. Instead, the massive wound inflicted by the fast turning prop becomes infected and inflamed. The docile mammal suffers and dies slowly. Despite rigid fines and tough enforcement by state game and marine officials, the manatee population declines every year.

While the animals are normally shy and afraid of bubbles, they have little natural fear of snorkelers. They are a protected species, and divers and swimmers are prohibited by state and federal laws from harassing, chasing or otherwise molesting them. Certain sections of the Crystal River basin are designated as manatee sanctuaries and no one is permitted

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Photo C. 1984 Wes Skiles



Mark Leonard

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FLORIDA SPRINGS

to infringe. A note of caution: "Harassing" the manatee is largely open to the interpretation of the official who views the incident. If the animal comes to you, there is normally no problem. If you go to it, you are risking a ticket and fine. It is certainly best for you—and the animals—to watch and photograph, but not touch.

Manatee watching is not the only Crystal River attraction. Even when they are absent (there are some that stay year-round but are difficult to spot) divers still come to these springs. King's Spring is an easy dive reached by rented boat. Surrounded by water often shallow enough to stand with your head above the surface, the spring is alive with bream



Florida's springs and rivers offer exceptional underwater visibility and year-round temperatures of 72°F. Above: Divers in the Rainbow River. Below left: a Florida Springs manatee. Below right: Divers and inner tubers in the Ichetucknee River.

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photo/Doug Perrine



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and colorful sunfish that have learned to eat from your hand.

The spring itself is approximately 25 yards across with a near vertical drop on one side to a 30 foot deep sand floor. There you find two entrances where divers can safely swim into a cavern to a maximum depth of 60 feet. Opposite the cavern is a permanent U/W manatee monument donated by several dive equipment manufacturers. In addition to King's Spring, others such as Catfish Corner, Mullet and Grand Canyon offer varying degrees of attraction. Visibility in them depends on weather and season.

One of the most popular Crystal River area dive sites is currently the focus of a controversy between divers and county officials. Near Dunnellon, east of the city of Crystal River, the Rainbow River explodes through its own floor. Instead of joining deep in the ground to form a single large flowing spring, thousands and thousands of percolating springs, one inch or less in diameter, flow directly out of the ground. This has always been one of the state's most popular areas for



FLORIDA'S SPRINGS

The crystal clear springs and meandering rivers of central Florida are easily reached and attract hundreds of thousands of divers and other watersports enthusiasts each year.

commercial underwater photography because of the unprecedented visibility. It's as great or greater than 300 feet!

At the fringes of the river are several shallow snorkeling spots where thick grasses are overshadowed by lily pads. The fish seem to be suspended in water so clear it is difficult to imagine. Filled with rocks, plants, logs, bass and turtles, the circumference of the 100 yard wide, 16 foot deep spring's head is lined with huge cypress trees and exotic elephant ear plants. The fish are friendly since fishing of all types is prohibited.

One local official is reported to have claimed up to 80 percent of all divers are purposely removing rocks and plants from this beautiful setting. In our one-half dozen visits we have never seen anyone remove anything. With ecology commonly a part of dive instruction, it is unlikely more than a mere handful ever deface the river. Regardless, instead of banning the removal of rocks and plants, just as fishing, food and drink have been restricted, well meaning, but poorly informed officials are basing their cases on the actions of one or two actual incidents and have refused access to divers. As of this writing, you can swim in the spring, but you cannot dive. Several area operators are fighting this biased and unfair restriction and will welcome your support. At present, we suggest you check before chancing the one-half hour trip that may cost you a day in court.

Two hours to the north, concentrated

around the Suwannee, Ichetucknee and Santa Fe Rivers, are the largest number of clear divable springs in Florida. With services at Gainesville, Branford and near High Springs, divers can explore more than two dozen sites. Some contain the remains of Civil War era shipwrecks and natural as well as historical artifacts and collectibles.

In several, visibilities often run 200 feet and more. Some have large cavern mouths that are safe to explore at their entrances only. Stay within constant sight of the outside! Every year there are divers who simply will not heed the warnings posted at the entrances to almost every cave and insist on risking their lives. Far too many die. *Do not go into an underwater cave without being fully trained in the highly specialized techniques that are required by the overhead environment.* This includes cavern exploration as well as cave diving. For those who must, certified instruction courses in these techniques are available at many area resorts and dive service centers.

Springs near Branford, which provide a safe environment with plenty of open water area, include Royal, Yana, Peacock, Troy and the Ichetucknee River. All have cave systems that must be avoided. In their open basins are schools of freshwater fish and numerous interesting photo settings. The Ichetucknee is also popu-

lar with nondivers since the most popular local activity is tubing. On most summer weekends you can find thousands of people lazily floating on rented inner tubes. A dozen feet below, divers are combing the bottom for artifacts.

Between the Ichetucknee and I-75, south of High Springs, several springs are among the most popular in the area with weekend divers as well as week long vacationers. In a private camping park, Devil's Eye and Devil's Ear are separate openings to a single spring. A few hundred yards away, Ginie has a long slough that allows a nearly unobstructed 200 foot view.

The cave system of Devil's Eye and Ear is relatively close to the surface and is restricted to only those who are trained cave and cavern divers. However, you can safely dive as deep as 30 or 40 feet without encountering a problem. Just inside the cavern mouth of Devil's Eye, the fast flowing water has carved vertical columns into the white limestone. A large log is slanted across its entrance. If you can brace yourself against the flow, the log makes a great photo prop. The shallow waters surrounding the spring contain many artifacts, including the remnants of the Indians who once lived near the spring and river.

Ginie is the only truly safe cavern for novice divers in the area. There is a large

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FLORIDA SPRINGS

steel grate across its cave entrance and divers can swim to a depth of 60 feet and explore a large cavern with the surface always in sight. Because there are no rooms or side passages to conceal the opening, you can get the feel of cavern diving safely.

The Santa Fe River, into which each spring flows, has many cracks and crevices in its shallow bottom. River explorers sometimes return with arrowheads, spearpoints, camel's teeth, python vertebrae, shark's teeth and many other interesting objects. Visibility in the river can be limited to the length of your arm, owing to the brown tannic acid of the cypress trees, or up to 30 or 40 feet, depending on the season of the year.

HELP SAVE THE MANATEE

The manatee can weigh over 1,000 pounds and reach 10 feet in overall length. Its only natural enemy is man. Over 10 percent of the state's manatee population may die each year, many killed by careless, speeding boaters that ignore protected waterways. A boat prop can easily kill or maim the manatee.

The State of Florida recommends the following steps to help save them:

- 1) Slow down in areas known to be inhabited by manatees. These usually have warning signs posted.
- 2) Do not touch manatees. Take all the pictures you want, but only if the animals approach you. Do not chase them.
- 3) When fishing, do not discard tangled line. Manatees are injured by fishhooks and line hidden in plants they eat.

For information on manatees contact:
Save the Manatee Club
Florida Audubon Society
1101 Audubon Way
Maitland, FL 32751
Report injured animals or information about their abuse to:
Florida Marine Patrol
Manatee Information Center
(800) 342-1821 (toll free)

Throughout this area of the state, divers are amazed at the natural beauty of the woods and rivers and the water clarity. Your family will want to go because of all the attractions as well as the excellent hotel and camping facilities found all over the Florida springs country. If you've always wanted to experience really unbelievable visibility, this is the place. But prepare yourself. When you are the storyteller people are going to accuse you of stretching the truth. Those who have never experienced it will find it hard to believe you can see almost forever. It's just too good to be true!

SDM travel

SECTION

For a host of reasons, divers are suddenly becoming aware of the vast treasure house of undersea wonders in the western Pacific. Naturally, the first destinations considered are the long time all-stars: Australia's vast Coral Sea or Truk Lagoon's fabled sunken wrecks—and justly so. See & Sea Travel's Grand Tours of the Coral Sea are the world's greatest diving adventures and See & Sea's *Thorfinn* cruises distill the highest essence of Truk's ghost fleet. More sophisticated travelers would immediately add the glories of the Philippines or the awesome ramparts of Fiji's Great Astrolabe Reef to explain the irresistible fascination of the new Pacific.

But, what of the other treasures scattered here and there that practically no one knows about? The exciting news is that several wondrous reef complexes are newly equipped for exploration. And, you could be among the first to experience them.

For example, did you know that for the first time ever there is an air-conditioned live-aboard dive cruiser in Palau? The *Sun Tamarin* is a 60 foot air-conditioned motor sailer. Now you may enjoy unlimited diving at Palau's greatest reefs without the bone rattling speedboat rides that have been the hallmark of this world famous area. Even more important, *Sun Tamarin's* live-aboard comfort and range open entirely new reef areas to you; dive Kayangel Atoll or explore the northern reaches of Babelthup. You may get new sites named for you in the pristine byways of this 300 island archipelago.

It goes without saying that on the *Sun Tamarin* you'll get a lot more diving than any hotel-based program could offer. Want to dive the 900 foot drop-off of Ngemelis Wall at dawn? Or, the colossal Quadruple Blue Hole as a night dive? Now, for the first time,



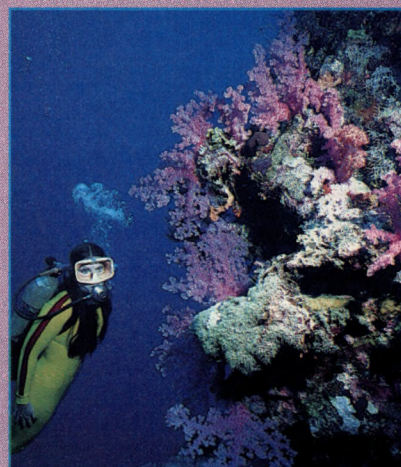
FAR PACIFIC TREASURES

Palau, Papua New Guinea, Thailand

TEXT AND PHOTOGRAPHY
BY CARL ROESSLER

you can. In the past, Palau became famous by showing divers no more than one-half dozen dive sites. Now, hundreds more are being found and you can join the process of discovery. For photographers, this is an opportunity to have pictures of untouched, remote reefs with jaw twisting names to awe your less traveled friends.

If the opening of Palau to live-aboard exploration is exciting news, you'll really love the sensational new live-aboard diving adventure in Papua



Top: The 60 foot, air-conditioned motor sailer *Sun Tamarin* carries divers to the most famous reefs, as well as entirely new sites, off Palau. **Above:** Jessica Roessler with soft corals on a Palau wall.

travel

New Guinea. This historic symbol of the primitive and exotic has never been accessible to divers because the finest reefs are scattered over hundreds of miles of ocean. In 1985, the premier Australian dive cruiser *Reef Explorer* began exploring such pristine areas as Manus Island, the Hermit and Ninigoe Islands, the coastal reefs beyond Madang and the wrecks of Hansa Bay.

Now in their second season, these cruises have expanded their itineraries significantly. For you, this can mean visiting the manta ray cleaning station, the sunken minesweeper or the place known only as the Hook. Even more, it means searching for new species for your photo collection.

The air-conditioned *Reef Explorer* will now offer the world's only all-star double: the mighty pinnacles of Australia's Coral Sea in the summer and fall and the new horizons of Papua New Guinea in the winter and spring.

For another undiscovered gem of Pacific travel we'll stray just a tad beyond the Pacific into the Bay of Bengal off Thailand. Here, in the deserted Similan Islands, are some of the finest talcum powder sand beaches in the world. Just off the beaches, beneath limpid waters, lie coral gardens and a host of tropical fish species you've never seen before.

See & Sea offers a two week experience in Thailand that includes three nights in lush, kaleidoscopic Bangkok and ten dive days in the Similans. I've seen a lot of reefs and even I was astonished to see big crown-of-thorns starfish in iridescent pink or purple, or the huge schools of tame batfish circling us in clear water, or the dense clouds of anchovies that swarmed about coral heads here and there across the reef. These were dives without any precise equal in the world and, in a sense, all ours as the first American group to dive them.

To enable you to discover this wondrous diving, our groups live aboard the 50 foot dive cruiser *Andaman Explorer*. With a superb crew, good food and unlimited diving, these reefs will be a most memorable experience.

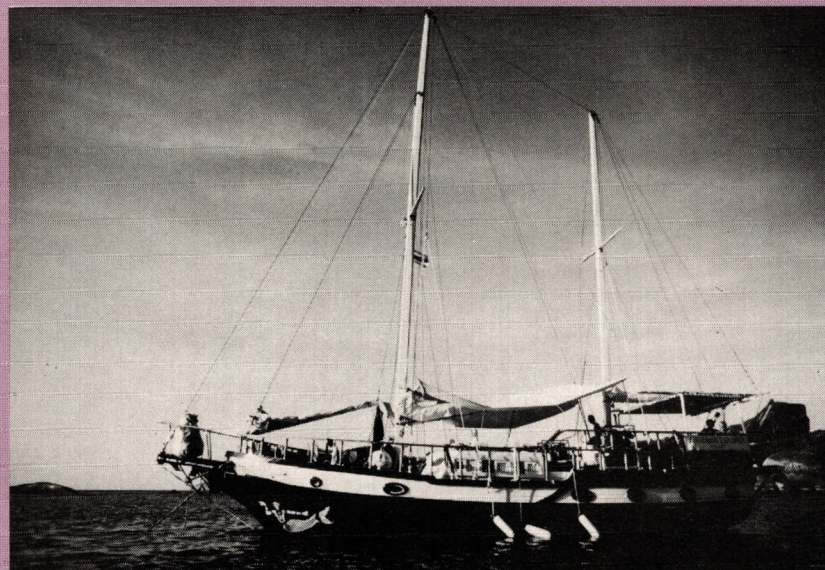
In a way, all of these new gems of



Above: The air-conditioned *Reef Explorer* cruises Papua New Guinea in the winter and spring. **Below:** Jessica Roessler with a variety of corals off Thailand. **Bottom:** Thailand's dive sites are reached by the 50 foot *Andaman Explorer*.

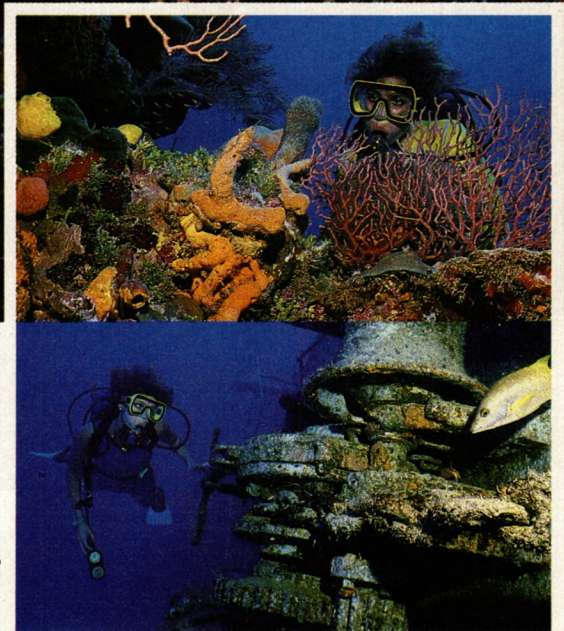
Pacific diving share a spirit of remoteness, sheer size and wide eyed discovery that will expand your diving horizons. The first lesson one learns in diving the Pacific is that everything is on a vast scale. Here, the best reefs are totally remote from any hotels or towns, often 100-300 miles from the nearest civilization. Immediately, this tells you that the Pacific's best diving can only be seen via live-aboard cruisers. It literally cannot be reached by day boat.

Palau, Papua New Guinea and Thailand await you. For further temptations, call (800) DIV-XPRT or write See & Sea Travel, Inc., 50 Francisco Street, Suite 205, San Francisco, CA 94133; (415) 771-0077.



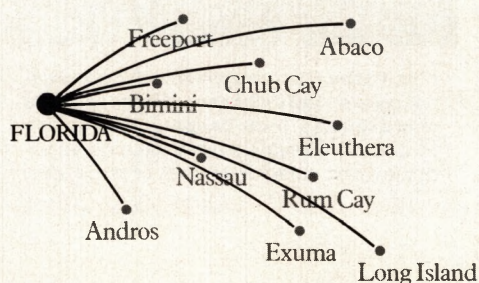
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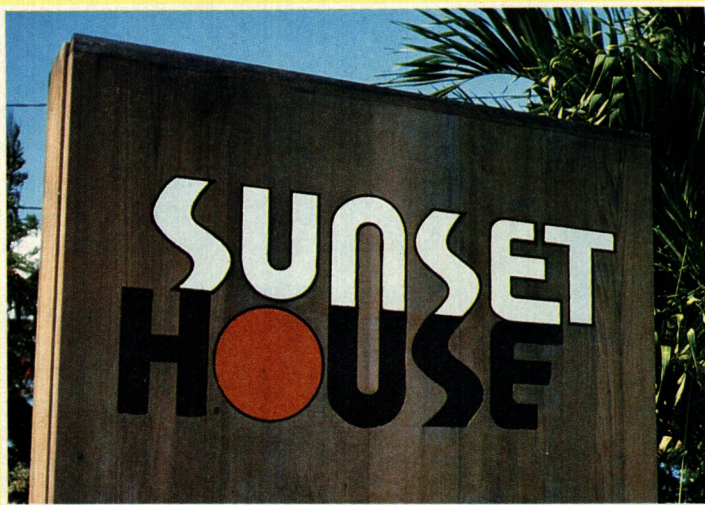
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It's Better In The Bahamas.



A Grand Cayman Diving Tradition



Top: Cathy Church swims with yellowtail snappers. Left: Sunset House guests board the 36 foot *Leopard Ray* at the protected slipway. Above: Guests enjoy drinks and snacks at the seaside bar.

TEXT AND PHOTOGRAPHY BY JIM AND CATHY CHURCH

"I want to express our satisfaction with the treatment we received at Sunset House during our first visit to Grand Cayman. I can assure you we intend to return . . ." Sunset House Album.

Sunset House began in 1958 as an eight room hotel just a few hundred feet from the Caribbean Sea. The offshore reefs were soon discovered by snorkelers and scuba divers followed. From this modest beginning, Sunset House has evolved into a popular seaside divers' resort. Today, with 42 air-conditioned rooms and two waterfront apartments with kitchens, a restaurant, boutique, seaside bar, dive operation and three dive boats, Sunset House is a one stop dive resort. And, for the many divers who return, Sunset House has become a Grand Cayman diving tradition.

Nestled against the coral ironshore just

The boat pulls into the protected slipway at 9:00 am and you step aboard for a two tank dive. The number of boats used depends on the number of divers: The 31 foot *Sundiver* carries up to 16 divers; the 36 foot *Eagle Ray* and *Leopard Ray* carry up to 20 divers each. All of the boats have ample open deck space with benches along the sides. An awning provides protection from the sun, tanks are stowed beneath the benches and cameras are nestled on the flat engine cover. The forward cabin provides extra storage space and contains a marine head. You can sunbathe on the deck forward of the bridge. The dive platform and ladder are at the stern.

The captains—Ron Levanas, Dan Morris or Pat Davis—begin with a poll to find out where the divers have been and where they wish to go. When the destina-

showed us crevices, large basket sponges, yellow tube and red finger sponges. Then a pair of French angels circled as if to welcome us to their under-sea home.

At Eagle Ray Rock, a few minutes from Armchair, bright sand slopes from 70 feet to depths beyond reach over the big wall. When you swim along the sand, follow your depth gauge, not the bottom! Look upward to massive pinnacles of coral that rise from 130 feet to within 50 feet of the surface. Overhangs, sponges, crevices and bright water offer the photographer many beautiful scenes.

The *Oro Verde* is a 197 foot freighter scuttled in 50 feet of water to create an artificial reef and dive site. The thrill of seeing her huge form is fantastic; from amidships, you can see the entire ship from bow to stern. The adventurous can enter her superstructure and cargo holds. We saw an intact motorcycle lying on the sand bottom, just forward of the bridge. When Cathy pretended to ride the cycle—while surrounded by fish and with the sunken ship in the background—the photographers in the group went wild.

Schools of yellowtail snappers have discovered the *Oro Verde* and hordes of sergeant majors have taken up permanent residence. All you need in order to gather a bouquet of fish around your hand is a pressurized can of cheese spread. The fish have learned to go after the nozzle, not your fingers. Just waving an empty can will attract a crowd of fish at this and many other Cayman dive sites.

The second dive of a two tank trip will be at a shallow site, such as Devil's Grotto, the Aquarium or the *Balboa*. Devil's Grotto, which lies less than five minutes from Sunset House by boat, is honeycombed with tunnels and caves at depths of about 5 to 30 feet. Shafts of sunlight piercing the coral overhangs of many caves stream downward to the sand. These shimmering fingers of light are a delight to visiting divers and a challenge to photographers. Occasionally, dense schools of tiny fish fill the caves while jacks and tarpon make predatory passes.

You can actually pet tame groupers at the Aquarium. They nuzzle right up to you expecting a free snack. Cathy has gently guided groupers and other fish into the close-up framers of her photo students. If you bring fish food in a plastic sack, expect to be mobbed by fish. Use only tiny pieces of food concealed in a film canister or bring a can of cheese spread.

The *Balboa*, the battered remains of a freighter that sank in George Town Harbour in 1932, is one of Jim's favorite sites. Lying in less than 35 feet of water, her twisted steel hull and ribs provide endless forms and shapes for wide angle photography. And, although other sites have their mobs of fish, the fish of the *Balboa* are definitely the most aggressive. When you enter the water, they rush to

Sunset House offers 42 air-conditioned rooms, two waterfront apartments with kitchens, a restaurant, boutique, seaside bar and dive operation with three boats.



south of George Town Harbour, on Grand Cayman's leeward, southwest side, Sunset House has an ideal location: The summer seas are almost always flat and water temperatures vary from about 84°F in summer to 80°F in winter. If an occasional storm arises, the Sunset Divers' bus takes you for a short ride to the south shore where the dive boats will be waiting to take you to one of that area's beautiful sites.

A typical diver's day begins with a visit to Sunset Divers to sign up for the day's dive and check out any necessary gear from Woody Woodbury. Manager Ron Levanas (the 1984 Scuba World Divemaster of the Year) and his staff can provide whatever you need, including 80, 71.2 and 50 cubic foot tanks. If your regulator needs adjustment, ask for equipment specialist Dan Morris (the Scuba World 1985 Divemaster of the Year).

tion is decided, they give concise, informative dive briefs and chart the dive profile on a large chalkboard. New divers are invited to take a gentle tour with dive-masters Steve Taylor or Woody and most opt for this special care. While time and depth limitations are enforced, experienced divers aren't required to take a tour or stay with the group—they can dive with their buddies.

Because Sunset House is south of the heavily dived Seven Mile Beach area, the boats can reach either West Bay dive sites—such as the *Oro Verde*, Big Tunnel, Orange Canyon or Trinity Caves—or several uncrowded southern locations. While there are many excellent sites, we can only describe a few:

Our first dive was at Armchair Reef, only five minutes south of Sunset House. It is part of Cayman's little wall that drops from about 30 to 70 feet. Dan and Steve



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SUNSET HOUSE

greet you. And, if they detect the slightest hint of food, they mob you. At night, a myriad of sea creatures emerges from hiding places. Octopuses, anemones, shrimps, large crabs, lobsters and other nocturnal sea life seem to parade across the Balboa's broken form.

The two tank dive trip ends about 1:00 or 1:30 pm and your thoughts automatically turn to food. Most divers head for Sunset House's thatched seaside bar for a cool drink and lunch. The menu includes fish and chips, burgers, hot dogs, cold sandwiches and salads and a daily special. While some divers decide it's "Miller time," you may plan an afternoon shore dive. Check out a tank from Sunset Divers and gear up on the concrete covered ironshore less than 100 feet from the bar. One giant stride and you're in 15 feet of water. The bottom slopes down gently and numerous coral heads and crevices will appear as you swim 200 or 300 feet out from shore. Don't be surprised if you are joined by a pair of angel-fish or if a large, stately barracuda glides by. You can make as many shore dives as the tables allow. At night, look for octopus, basketstars, lobster, pufferfish and orange-tipped anemones. At the end of the dive, getting ashore is easy: A ladder is attached to the vertical ironshore.

The large saltwater pool is an ideal place for kids and beginners to snorkel, for scuba instruction or for you to review your diving skills. It has a passageway to the sea, so you can head for open water whenever you are ready. Walkways connect the pool to the resort, making it convenient to use.

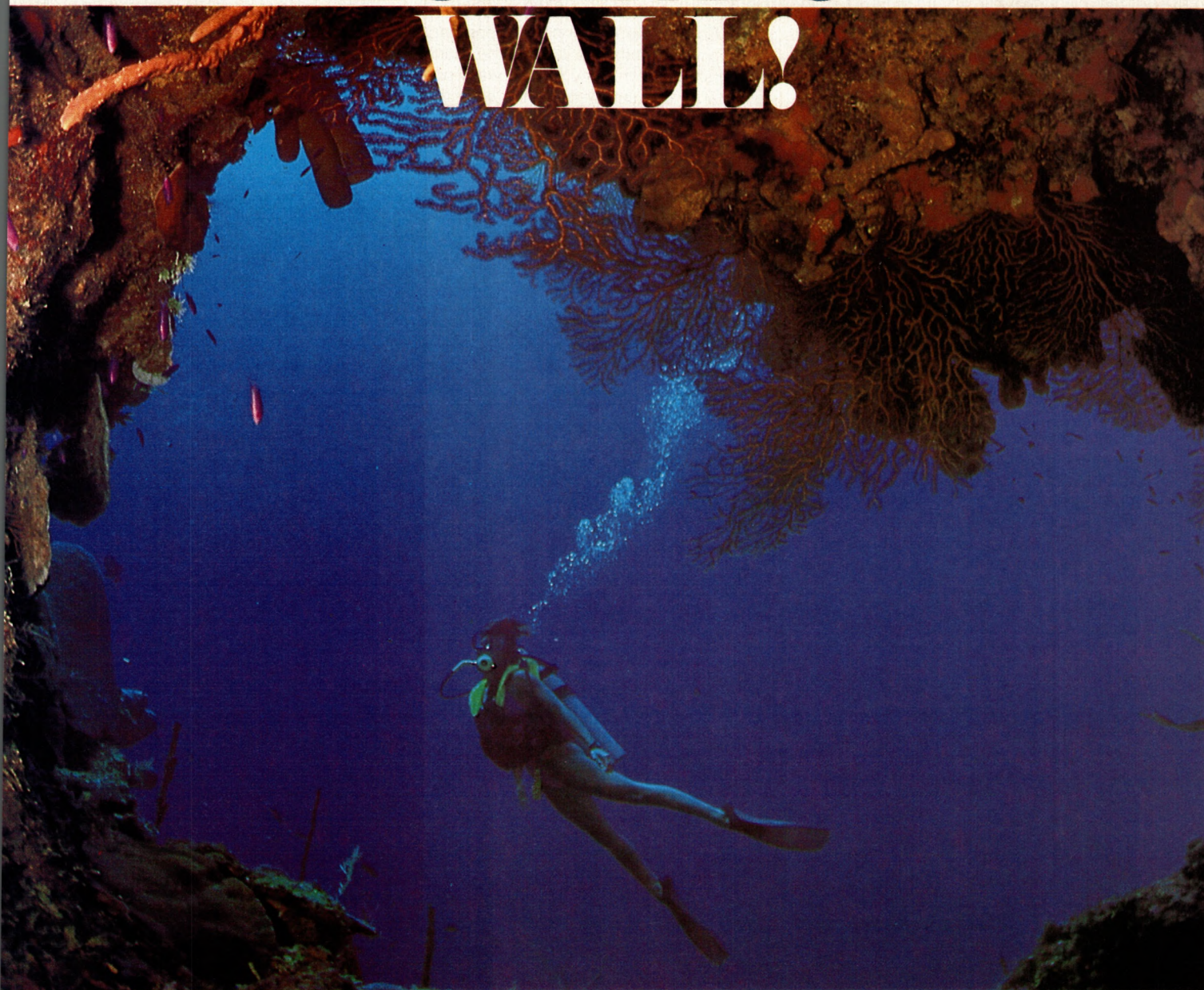
The Sunset Boutique, by the office, is a pleasant place in which to browse. They have fashion jewelry as well as swimsuits, beach dresses, T-shirts, film and the other items visiting divers usually need. We found everything from tapes featuring local music to books on fishes and other undersea life.

The Sunsetter Restaurant has large, screened windows to admit cooling breezes and is surrounded by lush palm trees. The setting is relaxing and the service provided by maitre d' George Chmil and his Caymanian staff is excellent. Dinner includes a salad, appetizer, main course, dessert and coffee. Chef Paul Hopkins prepares three entrees each evening and changes the menu daily. A lavish buffet is served Thursday evening and the Sunday night barbecue features chicken, ribs, fish and steak.

During the summer of 1986, Sunset House became home for the Jim and Cathy Church U/W photography courses. A large, air-conditioned classroom and E-6 processing lab have been installed for

(Continued on Page 82)

CAYMAN ISLANDS WALL!



“Those who know us, love us.”

Those who know us, love the safe, beautiful diving along the majestic vertical walls surrounding our three Islands. The magnificently colorful sponges, corals, and friendly marine life that thrive in our crystal clear waters. And the drop-offs that make our Islands a superstar among dive destinations. The Cayman Islands are a sunny, magical trio of islands nestled in the British Caribbean. The whole world doesn't know us. But those who do, love our Islands for exciting underwater adventure, as well



as for our highly professional dive shops and schools. They also love our people, whose warmth and attention to your needs make a vacation here unforgettable. Getting here is easy. We're just over an hour from Miami, two and a half hours from Houston via frequent jet service flights on Cayman Airways. Call your travel agent or Cayman Islands Department of Tourism. Beginners and experts alike will find that our enthusiasm for diving runs as deep as our Wall!

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CAYMAN ISLANDS



Department of Tourism Sales Offices: Miami/Houston/Los Angeles/New York/Chicago/Dallas/Atlanta/Toronto/London

Just about every island in the Caribbean has at least one shipwreck that is visited and enjoyed by divers, but Grand Cayman has one that is really different. For a one-of-a-kind wreck diving thrill, there is nothing quite like a visit to the *Kirk Pride*. She is a totally intact steel freighter perched on the drop-off at a depth of almost 800 feet!

An impossible dive you say? Not anymore. The wreck was discovered less than a year ago and is dived several times daily by Research Submersibles Limited (RSL). This small but enterprising firm utilizes two Perry Oceanographic submersibles for daily excursions down the face of the Grand Cayman wall. These 20 foot long deep submersibles can carry two passengers and a pilot, make four dives per day on a battery charge and feature a giant 36 inch dome port for a panoramic view of the sea.

Each dive is a one and one-half hour experience that takes you well beyond the maximum depth limits of scuba and down into a bizarre world of deep ocean creatures and strange marine growths. Visibility is crystal clear and the view of the shipwreck is spectacular.

The history of the *Kirk Pride* is well documented and her sinking involves several notable diving celebrities. The freighter was one of six identical ships built in 1949 by Vickers of Montreal, Canada. They were consigned to South America where they were utilized for coastal shipping of general cargo.

The *Kirk Pride* is a 498 gross ton steel cargo vessel measuring 170 feet long with a 30 foot beam. Powered by a single screw air-start engine, she carried a single mast amidships. She was equipped with four deck winches for loading cargo through her three deck hatches.

In 1958, the ship was purchased from the Venezuelan government by William N. Kirkconnell, president of the Kirk Pride Shipping Company of Cayman. It was used for shipping cargo between Florida and the three Cayman Islands.

On January 9, 1968, the *Kirk Pride* was tied up at the George Town dock undergoing repairs. She had developed an air lock somewhere in the fuel line and the ship's engineer had been repeatedly starting the engine while working out the problem. The *Kirk Pride's* engine utilized an air pressure starter motor and by this time most of the air pressure reserves had been used up.

By noontime of that fateful day, a nasty northeaster had erupted and the decision was made to move away from the dock. It was imperative to get the 160 foot ship out of the small harbor to prevent the storm from pounding her to pieces.

The engine was successfully started and the ship backed out of the harbor, 125 feet from the dock. It was then that the *Kirk Pride* suffered her fatal mishap.

In order to switch gears from reverse to forward, it was necessary to shut down the engine and restart it in forward rotation. It was only after the crew had stopped the engine they realized there was no air pressure left for a restart.

The drifting ship was driven against the rocks, suffering several mortal wounds. Seawater began pouring through two gaping holes in her hull. By late afternoon, Bob Soto arrived on the scene and made a valiant attempt to save the foundering ship. Emergency pumps were put on board and sufficient water was removed to allow the *Kirk Pride* to be towed out of the harbor. By now, it was getting

over the edge of the wall. At 200 feet they still could not find any sign of the *Pride*: The massive weight of a water filled ship had snapped the chain like a pretzel.

The *Kirk Pride* remained lost for almost ten years. It was a decade of conjecture and rumors. Did the wreck slide down the Cayman Wall to 6,000 feet or was she hung up on a ledge somewhere? Did she smash into 1,000 pieces or had she remained partially filled with air and drifting with the currents? No one knew for sure, but everyone had a theory.

When RSL began operating deep submersible tours in Grand Cayman, stories of the legendary *Kirk Pride* revived. The

DEEP WRECK DIVE

Cayman's Kirk Pride Remains Totally Intact At 800 Feet

BY GERI MURPHY

dark. Little more could be done until the seas calmed and daylight arrived to allow the safe patching of the hull.

The damaged ship was anchored outside the harbor in about 60 feet of water. The main objective was to keep her a safe distance from the rocky coral shore, concrete pier and other hazards. No one gave much thought to the nearby drop-off since the wind was blowing inshore.

During the evening, two events occurred, simultaneously causing the final calamity. First, the wind changed direction, thus swinging the ship around. The *Kirk Pride* was now poised right over the Cayman Wall. Second, the amount of water that poured into the *Kirk Pride's* holds began to overwhelm her pumps. She was a doomed ship.

The crew was evacuated from the sinking ship. The *Kirk Pride* slipped beneath the waves at 9:30 pm, January 9, 1976. It was not until the next morning that anyone realized the ship was gone. Then, divers Bob Soto and Jack McKenney began a search for it. They descended to the point of her last anchorage, found the anchor and began tracing the chain. The signs were ominous. The taut chain pointed directly out to sea and led downward

sub pilots dreamed of finding the lost ship, but the project was placed on the back burner. RSL was struggling with the challenge of promoting a whole new concept in vacation experiences. They had to convince the public and the government it was perfectly safe to take people on submarine rides to 800 feet.

Much of RSL's wall diving was conducted close to George Town harbor because it was close to their base of operations and because the wall is quite interesting in that area. Since the *Kirk Pride* was reported to have sunk in the same vicinity, the sub pilots began a slow, methodical grid search of the area.

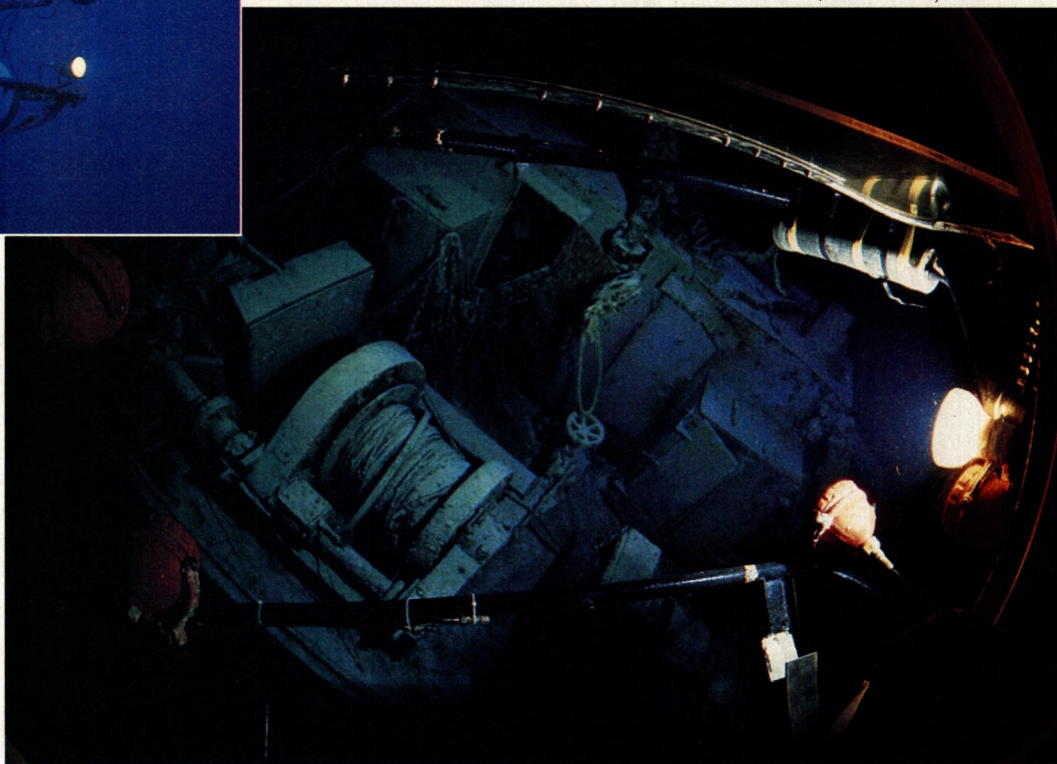
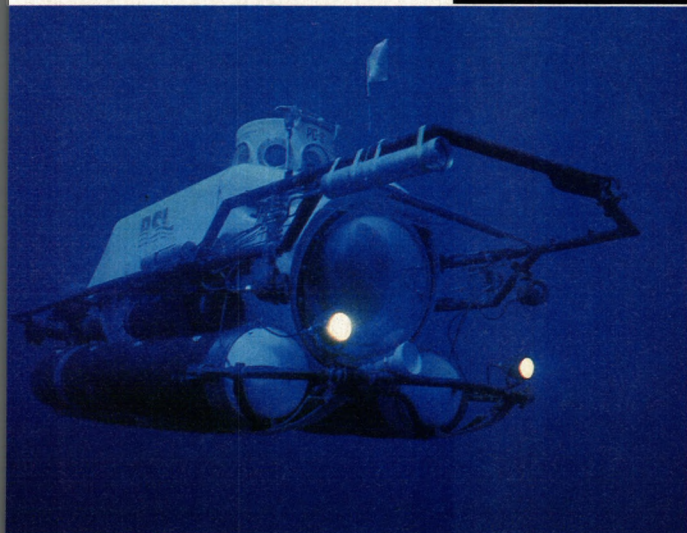
On November 22, 1985 the *Kirk Pride* was discovered almost by accident. It happened on a routine dive, the last of the day. Chief sub pilot Stuart Mailer was cruising along the wall at almost 800 feet, exploring the odd limestone formations known as "haystacks." These massive chunks of rock are believed to be pieces of the wall that have broken off and tumbled down the drop-off. Some haystacks measure 50 to 100 feet across.

Pilot Mailer was carrying two passengers in his sub, Larry Swigert from Dallas and Ken Brady of Thornwood, New York.

Research Submersibles Limited's submarines can carry Cayman visitors to a fabulous deepsea world far beyond the range of sport divers. The totally intact wreck of the *Kirk Pride* is a favorite site. Right: The stern of the wreck, at 780 feet, shows its name. Below: RSL's PC-8 submarine underwater off Grand Cayman. Below right: The midships superstructure of the *Kirk Pride* at a depth of 750 feet. Bottom: Submersible pilot Stuart Mailer discovered the *Kirk Pride*.



photo /Courtney Platt



photos/Geri Murphy



Both were divers and passengers on the *Cayman Aggressor*.

History was made at 3:10 pm when the long lost ship was spotted. Swigert was standing up and peering through the small ports of the conning tower, while Mailer and Brady were viewing the sea-floor below. An unusual, dark silhouette loomed out of the dim shadows ahead.

Swigert yelled, "What's that over there?" A few seconds later the fuzzy shadow crystallized into the sharp lines of a steel hulled wreck.

The long lost *Kirk Pride* appeared out of nowhere like a ghost. The water was extremely clear and the ship appeared totally intact. She sat almost upright, her hull wedged against a great rock at pre-

cisely 780 feet. Very little marine growth had accumulated on her hull or deck and the white paint of her superstructure still sparkled. Emblazoned on the stern was her name. The ship was so clean and well preserved one would swear she sank only yesterday. The first encounter was exciting and at the same time eerie. Finding a ghost ship 800 feet below the

(Continued on Page 88)

800 FT WALL DIVE



PHOTOS BY GERI MURPHY

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SUNSET HOUSE

(Continued from Page 78)

their exclusive use. Sunset Divers provides an exclusive photo boat and crew for each of the Church classes. Courses usually run from May to October and in 1986 were booked solid months in advance. The 1987 course information will be available this December.

At night, My Bar—one of the few open-air, thatched bars on the island—comes alive. Bartenders Robert and Regal stand ready to serve piña coladas, liquors, beer or soft drinks. An interesting mix of locals and visiting divers gathers each evening to socialize. The Caymanian people are friendly and fun to talk to. We've spent many peaceful hours waiting for the green flash of the Caymanian sunset, enjoying the cool breezes or watching the activity at the domino game. If you missed dinner, or just want a snack, deep-fried chicken, pizza and other short-order foods are available Monday through Saturday. Each Friday night features a happy hour with free snacks and My Bar is the place to be.

Bonnie and Adrien Briggs, owner/managers of Sunset House also offer their 33 foot Gulf sailboat, *Nepenthe*, for private charter as well as day and evening dinner cruises. For more information about a diving vacation at Sunset House, or *Nepenthe*, write to: Sally Caldicott, Sunset House, P.O. Box 479, Grand Cayman, British West Indies or phone (809) 949-5966. For Sunset House reservations, call Sally at (800) 854-4767. To be placed on the Jim and Cathy Church mailing list for summer of 1987 U/W photo course information, write P.O. Box 80, Gilroy, CA 95021-0080.

CAYMAN ISLANDER MOVE

Cayman Islander Hotel sales and reservation office has moved. The new address is, 5821 Hollywood Blvd., Suite 203, Hollywood, FL 33021. You now can call toll free in the U.S. (800) 922-7555; in Florida (800) 423-7555. The local number is (305) 981-7555.

The Cayman Islander also has a new general manager, Red Miller. A native Caymanian, Miller knows how important tourism is to the Caymans. "I don't want any of my guests to go back unhappy. Those type of people tend not to return. When they visit, I want them to feel as welcome as if they were personal guests at my own house!" he says.

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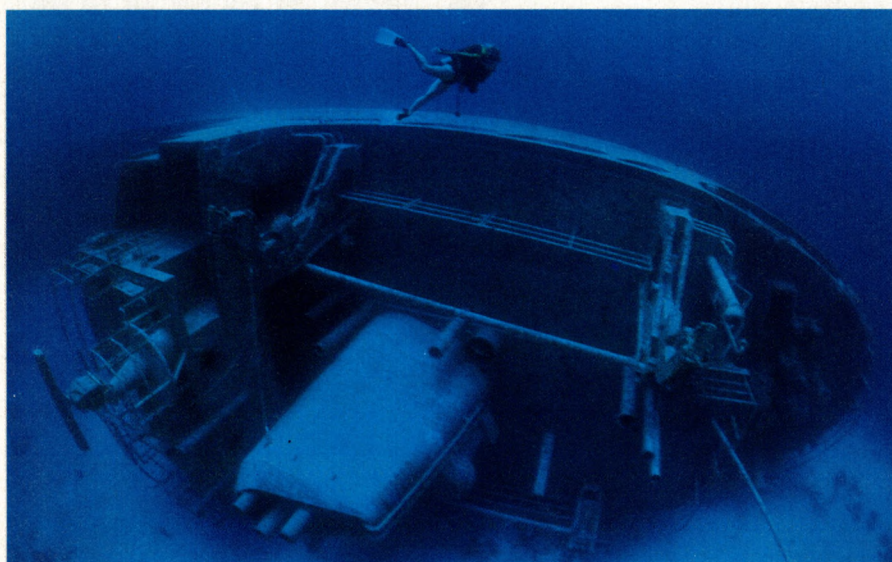
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TEXT AND PHOTOGRAPHY
BY RICK FREHSEE

Blackbeard's Bahamian Odyssey

A Sail/Dive
Adventure In
Legendary Isles



Top left: *Morning Star* and *Sea Explorer* cut through crystal clear water off the Bahamas. Left: Theo's Wreck off Freeport, Grand Bahama. Top: Guests enjoy the main passenger saloon on *Morning Star*. Above: A tandem anchor at sunset. Below: A Chalk's seaplane. Opposite page: Coral formations in shallow water off the Berry Islands.



The first few days roll by slowly as biorhythms adjust to the tune of the Bahamas; but the second part of the week disappears in a blur proving that time indeed flies when you're having fun. Fun and great diving is what Blackbeard's Cruises is all about and they serve both in big helpings. This is an adventurous but leisurely life of blue water sailing, world class scuba diving, beachcombing, cookouts and out-island exploration in the blue-green kingdom of the Bahamas.

Blackbeard's three live-aboard sailboats, *Pirate's Lady*, *Morning Star* and *Sea Explorer*, normally leave Watson Island just east of downtown Miami each Saturday afternoon and return the following Friday morning with tanned and hap-



py divers aboard. Bruce and Peggy Purdy, the owners of Blackbeard's Cruises, did not invent sail/dive packages, but they certainly perfected the concept. Now, seven years later, they enjoy full bookings year-round with considerable praise and little criticism. I know, as I have made an annual trip with them for all those years and have just completed my latest adventure aboard the *Pirate's Lady*. For those who want something more than standard land based diving and yearn for island hopping and blue water adventure, Blackbeard's sailboats offer an exciting alternative.

Anyone who considers a dive vacation should know some conceptual differences. With land based packages, you normally enjoy a variety of amenities but are restricted to local diving areas. With a live-aboard motor vessel, you have the

greatest range of movement and, usually, unlimited diving. A sail/dive excursion offers a wide selection of dive areas and a "Jimmy Buffet" atmosphere. Aboard a Blackbeard's boat you experience the life of a sailor. It's a do everything or do nothing life of blue water adventure and no-name dive sites sprinkled with anchorages off sandy cays and island investigation. It's also good friends, rosy sunsets, spontaneous parties and the wonderful aroma of freshly cooked seafood. Above deck each night you can be thrilled with a sky sprinkled with diamonds and below deck, fall asleep to the sounds of water lapping the hull. Blackbeard's secret is that their vessels are motor vessels, when they want to be, for speedier access—and sailboats, when they want to be, for a Bohemian lifestyle.

The three to four day/night diving package will satisfy any hardcore diver but the ambiance of a sail/dive combo will perhaps appeal to those with more heart for adventure and romance. The itinerary can be adjusted each day for the location, weather and changing interest. There is usually a small group of 12-20 aboard; singles and couples can add up to a maximum number of 22.

Pirate's Lady, *Sea Explorer* and *Morning Star* are single masted, fiberglass hulled, modern 65 foot sloops equipped with single diesels. *Sea Explorer* has been operating for seven years, *Morning Star* since January 1983 and *Pirate's Lady* since October 1985. The vessels are almost identical and while there are differences in their appointments, the similarities are much greater than the differences. Each ship has its own compressor, water cooled tank storage boxes on deck with 44 aluminum scuba tanks and two dinghies—a rubber runabout and a Boston Whaler.

Each ship has a crew of seven, which includes a captain with special offshore sailboat licenses, mates, a cook and a fulltime divemaster. Blackbeard's crew is simply amazing. The involvement, attitude and service of crew members is no small part of the operation's people pleasing magic. This last cruise I actually hopped from *Sea Explorer* to *Pirate's Lady* at midweek to say hello to old friends and get to know a new crew. *Sea Explorer's* skipper is seven year veteran Bill Sang, with mate/wife Claudette who is preparing for her captain's license. Also on *Sea Explorer* is Russ Solger (seven years) and divemaster Bruce Simpkins (four years). *Pirate's Lady* has captain Jay Knudsen (seven years with two years off) and Bahamas veteran Art Curtiss (one year). Divemaster "Wojo," Robert Wojtonik (one year), was kind enough to help as camera assistant in addition to his usual chores. *Morning Star's* master is Dick Carr (seven years) with captain/first mate Mark Barrett (seven years) who has returned from a six month hiatus.

Gary Fleming (seven years) is a veteran divemaster who works on any of the three ships. Blackbeard's boats also feature excellent cooks and no matter which vessel you sail, high ratings will be given to many individual crew members. In Miami, operations manager Ray Temmeyer (seven years) keeps things humming on these constant turnaround cruises.

Considerable effect is achieved in the overnight trip across the Gulf Stream, leaving the concrete mountains of Miami and arriving the next morning in Bimini or thereabouts, with the sun dancing on crystal waters. Calmer waters is a function of the Bahama Bank and the cruise direction is selected according to the desires of the passengers with advice from the captain, who spends 80 percent of his time in the islands. There are three directions to consider: south along the cays and ragged rocks lining the western fringe of the Great Bahama Bank; toward the northern fringe to the Gingerbread Grounds and/or the West End and Freeport, Grand Bahama; or eastward across the big bank to the Berry Islands at the top of the deep water trough known as the Tongue of the Ocean.

The closest area, south of Bimini, has what I consider some of the best diving in the Bahamas. The pristine reefs of Cat Cay, South Cat Cay and the Victory Cays are exquisite, fish loaded systems with a variety of depths and topography. These reefs have one foot planted on the Bahama Bank—known as one of the world's great marine nurseries—and the other foot immersed in the Gulf Stream—famous for world class sportfishing and excellent visibility. Here you may see a shark or a marlin or a school of tuna or kingfish in water with 200 foot visibility. Without that happening, you will be thrilled with ordinary encounters with groupers, turtles, eagle rays and schools of grunts and snappers parading over and through fantastic coral grooves. Blackbeard's introduced me to a fantastic wall dive that started in only 85 feet of water (shallow for this side of the bank). I was greeted by a marvelous school of silvery spadefish and an exciting pair of spotted eagle rays.

The Bimini area also provides the wreck of the *Sapona*, the famous rum running ship that was the proposed target of the lost Avenger Squadron, and the Bimini Road, a curious display of huge regular stones reported to be part of the Atlantis legend. The Berry Island run features beautiful shallow coral gardens like those at Mamma Rhoda rocks and, at the edge of the Tongue of the Ocean, the deep wall to the abyss where I once watched a pair of hammerheads play. The Grand Bahama run features the West End deep reef and/or the Gingerbread Grounds for old wrecks and big grouper—and Theo's Wreck, a huge modern

(Continued on Page 102)

Australia The Wo

AIR QUEENSLAND TO LIZARD ISLAND.

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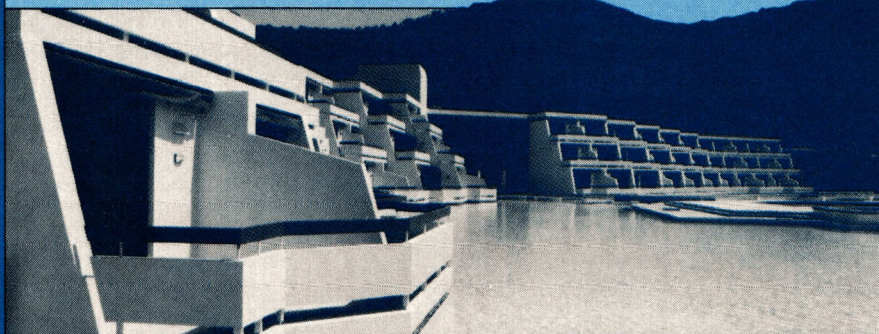


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How do you improve on paradise? That's what the world will discover in late 1986 when Hayman Island Resort reopens after a \$AUS120 million reconstruction program. This complete holiday island on the Great Barrier Reef will offer superb accommodations for the whole family: complete air-conditioning, 24-hour room

service, 5 international class restaurants, water skiing, sailing, and nightly entertainment. A 25-knot dive boat offers fast daily access to Bait Reef and beyond. Hayman can be reached by Ansett Airlines jet to Hamilton Island, and transfer on the luxurious M.V. Sun Goddess. Call *Dive In Australia*, (415) 928-4480.

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nder Down Under.

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For one of the world's truly awesome underwater spectacles, explore the Great Barrier Reef and the Coral Sea with Australia's longest-established dive boat service. Discover virgin reefs, thousand-pound marlin, rays and turtles as you sail aboard the 12-passenger Reef Explorer or 10-passenger Auriga Bay. For larger groups, the company also operates the 112-foot, 20-passenger Challenger. You can enjoy day dive trips from Cairns to the Great Barrier Reef on the Down Under, a 41-foot, high-speed catamaran. All vessels are available for charter. And they all have sophisticated navigational aids such as a satellite navigator to pinpoint submerged reefs, autopilot, radar, and echo sounder. Barry May, a pioneer of Australian dive tourism, is an expert at finding superior diving sites. For more information about Reef Explorer Cruises and its wide variety of dive packages, call *Dive In Australia*, (415) 928-4480.

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MIKE BALL WATERSPORTS.

Watersport specializes in regular, guaranteed departures to the legendary Yongala wreck and Great Barrier Reef. E-6 processing, diver propulsion vehicles, sailboards and PADI specialty courses available on board. This very large, stable,

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PORT DOUGLAS.

Located in tropical Port Douglas is Australia's northernmost fully professional diving facility serving the Great Barrier Reef. In a little over an hour, their 55-foot custom-built luxury dive boat will speed you at 25 knots to some of the best dive sites in the world. There you can enjoy stunning underwater scenery with the expert assistance of the boat's professional crew. The company also offers exciting land-based packages that include 4-wheel-drive Safaris through one of the world's last remaining virgin rain forests — a tropical adventure you will long remember. For more information, call *Sea Safaris*, (213) 546-2464.

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The only diving resort situated on the Great Barrier Reef, Heron Island offers access to some of the world's finest diving. Full dive facilities include four dive boats and over 60 rental scuba tanks. Only 26 minutes from Gladstone by helicopter, Heron is the home ground of tame moray eels, friendly manta rays, sea turtles (seasonal), and a huge variety of fish and coral. This colorful sea life makes it ideal for underwater photography. Lodging is available to fit most budgets and includes three meals and two dives per day, as well as tanks, weights and air. For information, call (714) 786-0119.

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DEEP WRECK DIVE

(Continued from Page 81)

surface can be an unsettling experience.

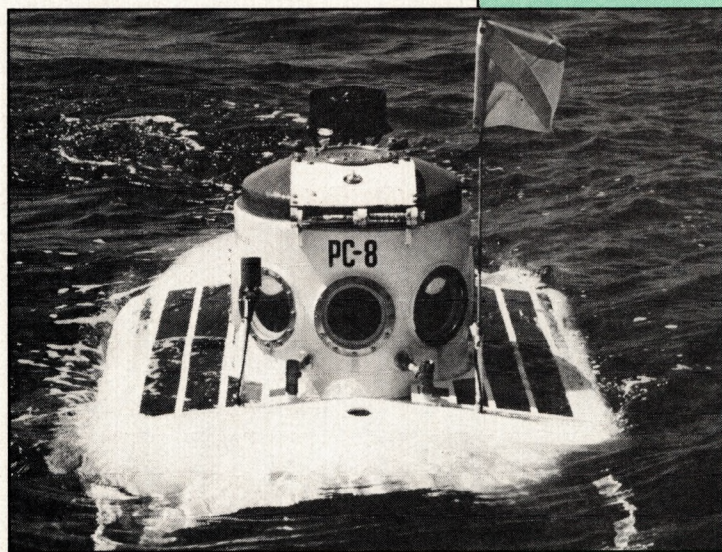
Today, the *Kirk Pride* is visited daily. It is Grand Cayman's newest celebrity shipwreck. Divers come from around the world to make their personal pilgrimage to the world's deepest diveable shipwreck.

RSL currently operates two Perry deep submersibles on a daily basis and has a third ready to go into the water. This past July, RSL celebrated its 2,000th dive without a single mishap.

Each sub can take only two passengers per dive and makes four dives per day: at 9:00 am, 10:30 am, 12:00 pm and 1:30 pm.

The sub pilots are extremely skilled and can maneuver surprisingly close to the wreck. U/W floodlights mounted on the front of the sub help to illuminate it while passengers busily shoot photos through the 36 inch dome port. Using high speed film of ISO 400 or faster, passengers can obtain unique wreck photos.

The wreck is often inhabited by large, deep water pelagic fish such as 100 pound amberjack, sharks or giant jewfish. Strange benthic creatures—such as

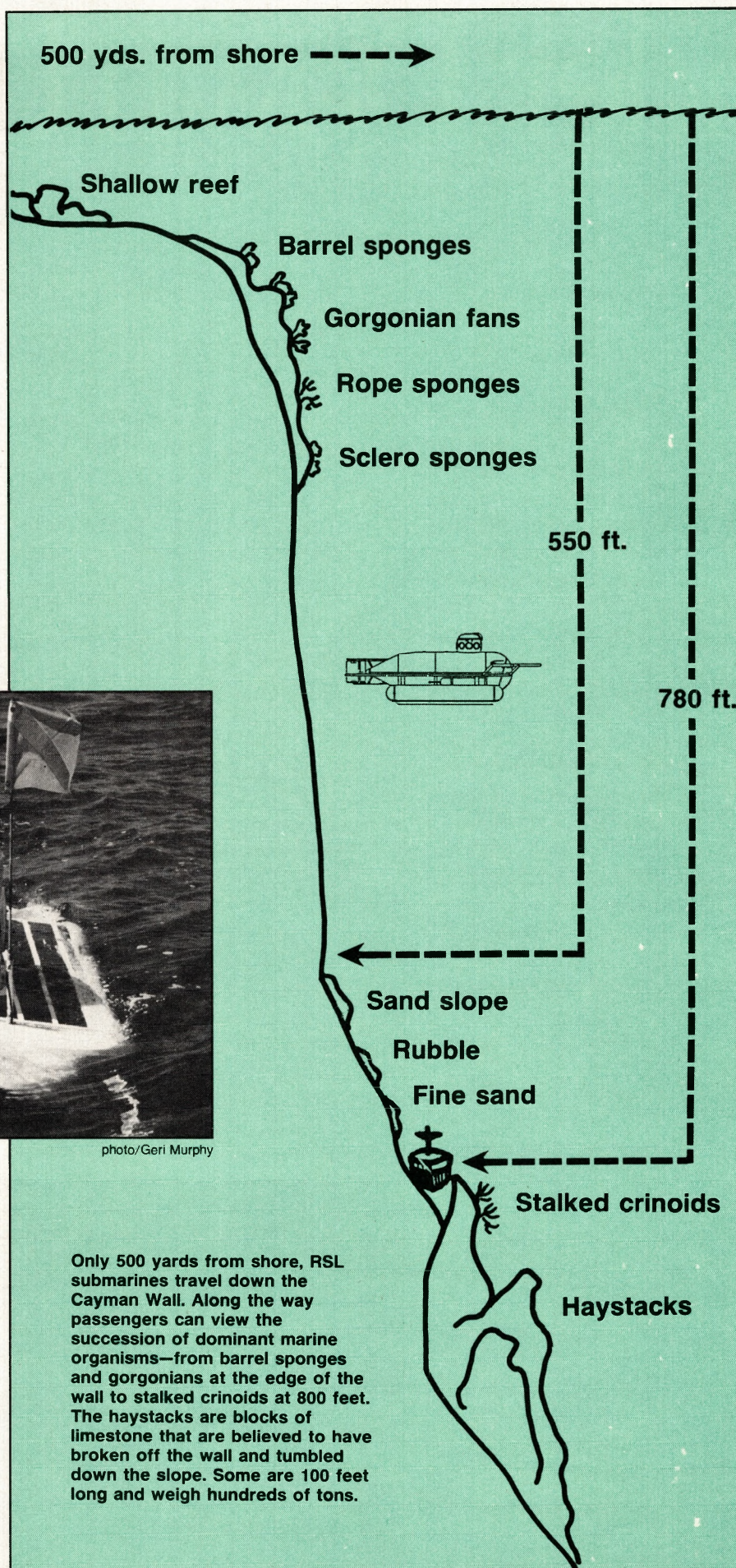


photo/Geri Murphy

the stalked crinoid and pure white lace coral—can be found growing on boulders close to the wreck. The stalked crinoids are as big as basketballs.

The entire dive lasts approximately 90 minutes, while the pilot gives a personal running commentary on how he operates the sub and what passengers are viewing. The experience costs \$200 per person and is worth every penny. Some passengers are so fascinated with the deep submersible dive that they make two or three trips.

For more information and reservations, contact: Research Submersibles Ltd., P.O. Box 1719, Grand Cayman, BWI or telephone (809) 949-3870. Be sure to make your reservations well in advance as space is very limited. ✕



"HOW'S THE VIS*?"

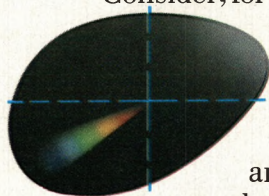
Finally! As good above the water as you've always longed for below the water

When you pay a premium price for an automobile, you quite rightly expect superior workmanship. We regret to inform you that this logic does not hold with sunglasses.

Consider, for example, what some flimflam artists are calling "lenses". Often, they are no more than the cheapest available plastic or glass, lightly-tinted in the latest designer color.

You won't find any such glasses with our name on them.

We are not in business to make fashion sunglasses to wear in restaurants.



Optical-quality lenses

Our glasses are designed to provide eye protection from the sun.

All our lenses are Polarized CR-39 or Polycarbonate, the same lens materials opticians specify. They are optically perfect, hard-coated to resist scratches, and provide 100% ultraviolet protection.

Consider also our frames. Cheap sunglasses – and an appalling number of expensive ones – are made with nylon frames. The nature of this material is that it has a "memory," making adjustment impossible.

Costa Del Mar frames are hand-cut from top quality Zyl (cellulose acetate). It is both durable *and* thoroughly adjustable.



Frames are tumbled in exotic teakwood chips for 6 days.

And where our competitors' frames may be painted, ours are *polished* to a natural sheen by tumbling them in *teakwood chips* for six full days.

The quality is uniquely American-made, and each pair is backed by a full *lifetime warranty*.

Costa Del Mar sunglasses range from \$40 to \$100 in price.

Not enough money to gratify every purchaser's ego, perhaps, but enough to ensure that these are very simply the best sunglasses made.

CostaDelMar

Rx sunglasses also available



5-barrel hinges with "pinned" screws



*Visibility-key word for all divers

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his is the year of discovery for Posada del Sol, also known as the Inn of the Sun. Divers traveling here are first discovering the special charms and attractions of Guanaja—a beautifully lush and mountainous Bay Island in the Western Caribbean—and then coming to appreciate the unique advantages of Posada del Sol as their host dive resort. There are no roads on Guanaja, no telephones, no crime, no noise and no pollution. Here the sea is integral not only to transportation, but also to lifestyle and commerce.

Upon arrival, visitors to Posada del Sol are met at the airport dock for the short water taxi ride to the resort. I still remember my initial impressions of that ride: The soft afternoon light bathing the verdant hillsides of Guanaja; the blue translucent waters; native villages on stilts; and the grandeur of the Spanish style architecture of Posada del Sol, quality evident from even one-half mile offshore. With closer inspection comes greater appreciation, not only for the physical aspect of the resort, but for the attention and services provided for divers, the obvious target market for Posada del Sol.

Nestled along a palm lined beach with an incredibly verdant hillside looming behind, the white stucco architecture and red tiled roof are the only deviations from the broad expanse of green. The resort is comprised of 16 double rooms, four set up with king sized beds and the remainder with two twins each. In addition, one room also contains a separate sitting/dining area. All of the rooms overlook the ocean, with four of the units along the beachfront and 12 units along the elevated freshwater swimming pool. All rooms are tastefully decorated with wood beamed ceilings, ceiling fans, Spanish tile floors and marble counters and sinks. The construction seems quite solid and obviously carefully considered.

The pool area is surrounded by decking of native hardwood and is extensively landscaped. Orchids grow wild throughout the property and bougainvillea, bottlebrush and hibiscus provide colorful tropical accents. There is a central edifice that contains the lounge/video center and the dining area. The bar is open to the adjacent pool so drinks may be taken as easily at poolside as at one of the tables inside. Tables are set under the leafy canopy of mature foliage around the pool for those who prefer to dine outside.

The dining room can accommodate up to 44 guests and I found the food to be quite excellent (especially the desserts). Unlike some areas of the diving world, at Posada del Sol there is no need to fear the drinking water. The ample fresh water streams from natural mountain springs and is therefore not dependent upon catchment or desalination.

There is a lighted tennis court at ocean-side with a jungle mountainside to the rear. A little farther along the beachfront sidewalk is the boathouse/dive facility. There are two covered slips for loading and unloading the dive boats, as well as compressors, guest gear storage and scuba rental equipment. The compressors include a 50 cfm diesel primary and a 20 cfm electric back-up. There is 30,000 cubic feet of cascade air storage as well and a triple filtration system inline. There are 80 aluminum 3,000 psi cylinders, and the BCs, masks, fins, regulators, etc. you would expect of a top quality dive resort. In addition, this part of the complex also houses the regulator repair station, gift shop and an extensive exercise facility with both universal and free weights.

The marina can accommodate vessels with up to an eight foot draft and provides protected dockage for the Posada del Sol fleet of dive boats. The *Spanish Diver* is a 42 foot fiberglass V-hull, custom designed for divers by Hulls Unlimited. Powered by a 6-71 Detroit diesel, the *Spanish Diver* is equipped with tank racks, a walk-through transom, a dive platform with extended ladders, marine electronics including depth finder and Loran, and both covered and open areas of deck for comfortable cruising. The *Isleña* is a similarly equipped 36 foot fiberglass twin diesel dive boat and the *Top Diver* is a 25 foot open fisherman powered by a 350 horsepower inboard. *Top Diver* is typically used for small groups of specialty divers or for sport fishing, whereas most of the resort's diving traffic is accommodated on either of the two larger vessels.

Expanded services are projected for the underwater photographer. An E-6 darkroom is already under construction and should be operational by the time this article appears. There is a one-half inch VHS video system in an underwater housing to record the day's diving adventures and several rental Nikonos systems for the novice or as a comforting backup for the traveling photographer.

The principal owner of the resort, George Cundiff, and the general manager, John Propeck, are both former commercial divers who still maintain a love for the thrill of sport diving. George began diving 31 years ago, has owned his own commercial diving operations and has tremendous diving experience. John has logged more than 20 years as a diver and has spent more time in saturation at 1,000 feet than anyone in the world. This may make them sound like old mossbacks, but they are both young men who happened to get infatuated with scuba diving early in life. Today their efforts are directed toward providing safe, courteous services for their diving guests and presenting Guanaja's optimum diving potential. To that end they have employed

POSADA DEL SOL

Bay Islands Hideaway On Guanaja

TEXT AND PHOTOGRAPHY
BY STEPHEN FRINK

Tino Montorosso, a well known and experienced Bay Islander, as the manager of dive operations. Tino and his staff are thoroughly exploring the waters off Guanaja and have isolated literally hundreds of top quality dive sites. However, the aura of discovery to which I previously alluded applies not only to first time visitors to Posada del Sol, but to the diving staff as well. There is just so much diveable area surrounding the entire island of Guanaja that most of it has never been visited by man.

The intense geological forces evident in the formation of topside Guanaja are equally apparent underwater. There are sheer drop-offs, volcanic caves, pinnacles rising from the depths, caverns, ridges, surge channels and an extensive barrier reef system. For a variety of diving options within a short range, Guanaja is hard to beat. In a week's visit you will never experience it all, but that which you will see will very likely entice you back.

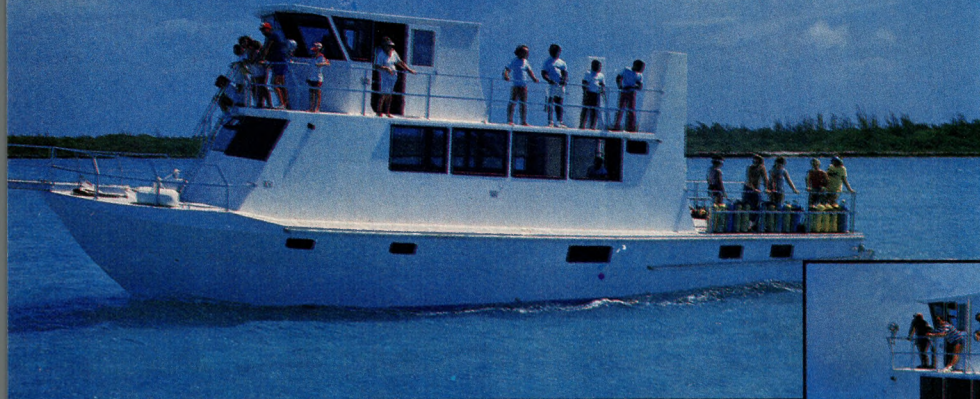
During our short visit we saw vertical walls beginning as shallow as 28 feet at a dive site called Vertigo. Populated by big grouper, cubera and mutton snapper—and abundant pelagic life such as eagle rays and turtles—Vertigo provides not only subject matter but the coral profiles to execute striking wide angle panoramas. One of the early dive groups to Posada del Sol was Scuba Den from Denver, and Nick Palandra had Nick's Humps named for him. In 85 feet of sparkling water (Guanaja's lateral visibility is usually in the 125-165 foot range) a mini wall rises to nearly the surface at the edge of the barrier reef. There are at least

(Continued on Page 96)

Guanaja is a beautifully lush and mountainous Bay Island in the Western Caribbean. In the waters around the island are sheer drop-offs, volcanic caves, pinnacles, caverns, ridges, surge channels and an extensive barrier reef system. Posada del Sol (Inn of the Sun) features grand Spanish style architecture and an elevated freshwater swimming pool. All 16 double rooms overlook the ocean. Below: Posada del Sol. Right: The pool area at night. Middle: John Propeck and Barbara Doernbach snorkel on the barrier reef. Bottom: Dive boats at the marina and the 50 cfm compressor.



Sol Mar III



Shimmering Star Of The Stella Maris Fleet

TEXT AND PHOTOGRAPHY
BY STEPHEN FRINK

The *Sol Mar III* (above and right) is the pride of the Stella Maris dive boat fleet. She is 65 feet long and offers a host of diver conveniences including a massive, stepped dive platform that, when lowered, has its floor actually below the water's surface. There is a full galley, air-conditioning, bunks for 18, two showers, two heads, an air compressor and more. Below: No Name Wreck. Bottom: Stella Maris guest cottages and Shark Reef.



For long time aficionados of sport diving, Stella Maris has traditionally been synonymous with high adventure and quality diving services. In the southern Bahamas Islands, just 150 miles south-east of Nassau, the Stella Maris Inn and Estate gained its reputation by offering spectacular diving within short boat rides of the resort; operating dive tours efficiently and with enthusiasm; providing comfortable accommodations and good food; and featuring friendly, courteous management. While these assets remain the base of Stella Maris' popularity as a dive resort, there is significantly more of interest within the contemporary Stella Maris diving scene.

Stella Maris (Star of the Sea) is on 3,000 lush acres between the east and west (windward and leeward) shores of Long Island. The Tropic of Cancer bisects the resort, making Stella Maris truly representative of the tropics by flavor, geography and weather pattern. Long Island is fairly large—more than 100 miles long with an average width of three to five miles—and is populated by 4,500 residents in 35 villages scattered throughout the island. Stella Maris in particular, and tourism in general, provides most of the employment for the native populace, but farming, fishing, mariculture and low key land development also contribute to the island economy. One of the most scenic Bahamas Family Islands, Long Island features countless powdery white sand beaches along the leeward shore, contrasting with a more rugged, rocky coastline to windward.



The Stella Maris Inn and Estate can accommodate up to 125 guests in a variety of hotel rooms, apartments and one bedroom cottages, townhouses and two or three bedroom bungalows and villas. Many of these units have kitchens, giving guests the option of structuring packages with meals or self-catered, and either with or without hotel activities. For those preferring meals provided by the hotel, there is a central restaurant and lounge offering three meals daily that are both delicious and wholesome. There are four swimming pools (including a 17 foot deep scuba training pool) and two tennis courts within the lavishly landscaped grounds, as well as a complete marina and airstrip. Nondivers and divers alike benefit from a very complete offering of complimentary hotel services including: daily land transportation; use of Sunfish sailboats and windsurfers; beach chair cabañas; a fleet of 30 bicycles; regularly scheduled snorkeling excursions; and evening entertainment such as underwater slide shows and videos, rum punch parties and the famous Stella Maris Cave Party (a cookout in an authentic pirate's cave only 100 yards from the resort).

The big news in terms of Stella Maris amenities is the completion of the *Sol Mar III*, the resort's magnificent new dive vessel. Under construction for seven years, the *Sol Mar III* provides an entirely new dimension to the available diving services. With an overall length of 65 feet and a beam of almost 19, the *Sol Mar III* is impressive even at dockside. Upon closer inspection she is a boat obviously built with diver convenience in mind. There is a massive stepped dive platform with the bottom level actually below the waterline for absolute ease of entry and exit, and an ingenious system of hydraulics to raise the platform when the vessel is underway. The pilothouse is raised forward and the aft deck is open for tank storage and gearing up. There is a full galley, air-conditioning, bunks for up to 18 guests in a dormitory configuration, two showers, two heads, a diesel Bauer air compressor for quick tank fills, a 15 kw generator for 120/220 electrical service, a bank of eight voltage stabilized charging ports, stereo and marine electronics. The *Sol Mar III* is powered by twin GM Detroit 6-71 diesels rendering a potential cruising range of more than 600 miles at nine to ten knots without refueling. For her intended purpose—day trips from Stella Maris and short overnight cruises to Conception Island, Rum Cay and other surrounding islands—*Sol Mar III* is state-of-the-art and a major addition to the Stella Maris diving program.

In addition to the *Sol Mar III*, the Stella Maris fleet includes a 21 foot diesel glass bottom boat that is especially popular for nondivers wishing to observe the excitement of Shark Reef; a 22 foot cabin

equipped sailing sloop; a 28 foot V-hull diesel dive boat for up to ten passengers; and a 34 foot V-hull diesel dive boat able to accommodate up to 14 divers. Another fairly recent addition is a deluxe 38 foot Delta cruiser set up for both sport fishing and diving. The *Golden Bear IV* is powered by twin diesels and is capable of cruising at 18 knots. Collectively, this fleet of boats permits tremendous versatility for both day and short overnight dive excursions and opens literally hundreds of top quality sites to Stella Maris guests.

Among the multitude of beautifully fascinating sites visited regularly, Shark Reef is perhaps the most unique and certainly the most requested. In just 30 feet of crystalline waters, the brilliant sand bottom is partially ringed by high profile coral clusters. It is rich with sponges and colorful gorgonians. By some fortuitous accident of nature, this is an area where bull sharks were sighted with some frequency and years ago Stella Maris dive-masters began to feed this shark population. These sharks are thoroughly condi-



Eberhard Foelling, Gerd Fuhrmann, Peter Kuska and Joerg Friese celebrate the long awaited launching of the *Sol Mar III*.

tioned to appear even as the anchor is dropped, making this safe, controlled shark encounter probably the most predictably consistent in the world. Stella Maris has been offering this adventure to guests for 15 years without mishap.

Typically, the guests settle into a comfortable area of the reef with a coral backdrop to watch the divemaster, most notably Jason Burrows, feed up to ten sharks at a time. Usually these are bull sharks in the three to seven foot range, but there is an especially gentle nurse shark, a queen triggerfish, an occasional stingray and several varieties of grouper consistently joining the parade. There is very little feeling of peril in this experience, even for divers unaccustomed to seeing sharks in the wild. There is more a feeling of fascination and appreciation for the majesty of these marine predators. For underwater photographers, there is the opportunity to record some quite remarkable images. Even from the perspective of the glass

bottom boat, Shark Reef is quite a show and worth the trip if only for this experience. However, Stella Maris diving is much more than just Shark Reef.

Diving from Stella Maris consists of four distinctly different formats. First, there is Long Island Northwest, along the lee of the island and featuring high profile corals, clear waters, minimal currents, calm seas and an abundance of approachable marine life. Most of these sites are within a 35 minute boat ride from the marina and less than one mile offshore. There are beautiful beaches nearby for lunch, a comfortable surface interval and a huge variety of snorkeling opportunities as well. There are at least 24 significant dive sites within this grouping, of which Shark Reef is one. The *Comberbach* is another. Sunk intentionally by Stella Maris in 100 feet of water, the *Comberbach* is a former island freighter now sitting upright and attracting an abundance of marine life. There are several Nassau groupers being handfed in the area. They will eagerly approach divers for a handout. Also, it's not unusual to see eagle rays swim past the wreck.

I confess an irrational attraction to horse-eye jacks. For some reason I find them especially fascinating to photograph, and Barracuda Heads, in 20 to 50 feet of water, provides consistent horse-eye encounters. Other Northwest dive sites such as Flamingo Tongue Reef and Blue Tang Reef are wonderfully productive for the fish photographer. Coral Gardens, a dive site in 15 to 30 feet of water, features particularly lovely wide angle reef scenics.

The Great Exuma Reef is also in the lee of Long Island but farther from shore, perhaps 5 to 15 miles. Here are literally hundreds of coral reefs in 60 to 90 feet of water. Looming dramatically from the sand bottom are incredible high profile coral heads, in some instances more than 50 feet high. Distinctly different from the shallower reefs nearer shore both in terms of resident fish and profile, this is the second Stella Maris option.

The North End/East Coast of Long Island provides the third dive format. Sometimes this shore is in the lee, but at times is exposed to the ocean swell. The best dive sites are close to shore and are comprised of a spur and groove coral formation densely populated with the typical Caribbean reef tropicals including angel-fish, squirrelfish, grouper, butterflyfish, eels, snapper, grunt, hogfish and others. Many of these reefs provide frequent pelagic sightings, especially in the vicinity of Eagle Ray Reef. Here, only one-third mile south of the resort, you can swim 150 yards offshore and descend along a reef that drops from the surface to 35 feet on the inside and gradually slopes to infinity on the outside. Of course, eagle rays are quite common, grouper are consistently

STELLA MARIS INN

found and an occasional blacktip shark may meander by. Grouper Valley is one of the more renown dive sites on this side of the island. In 40 to 80 feet of water, this site teems with marine life: huge grouper, sharks, schooling jack, bonito, pompano, etc. In early November groupers spawn in this area. Jammed next to one another in nearly three acres of piscine plentitude, it is a truly memorable sight!

The fourth Stella Maris dive option is the trip to Conception Island. Done either as a day trip or a two or three night excursion on the *Sol Mar III*, Conception Island is the wild, pristine stuff of dive legend. With vertical walls beginning as shallow as 60 feet, U/W visibility in the 150 to 200 foot range, tremendous fish life, colorful sponges and gorgonians, Conception Island compares favorably with any of the Caribbean hot spots. During our short visit we dove on Black Coral Pinnacles, a series of huge coral outcroppings colorfully adorned by all manner of sponges, gorgonians and massive clumps of black coral in only 60 feet of water. We also dove the Now No Name Wreck (so named because researchers studying the ship's history hope to accurately rename

it at a later date). The Now No Name sits in 30 feet of water along the nine mile Southhampton Reef. Her wreckage is scattered, with mammoth boilers, engine parts and shaft providing relief from the flattened hull plates. Probably dating from the early 1900s, the Now No Name was at least 300 feet long. Conception Island also offers a picturesque white sand beach and a comfortable, safe harbor for the overnight anchorage.

On occasion the *Sol Mar III* overnight excursion will include the dive sites around Rum Cay. In fact, Stella Maris offers an eight day, seven night package in collaboration with the Rum Cay Club whereby four diving days may be scheduled at each resort.

The Stella Maris Inn and Estate is very competently operated by Monica and Gerd Fuhrmann, Eberhard Foelling, Peter Kuska and Gabi and Joerg Friese. A 4,250 x 200 foot paved airstrip with tie downs is maintained for commercial and private aircraft visiting the island. Flights may be arranged with Bahamasair, which features four times weekly service, or with the hotel's regularly scheduled air service from Ft. Lauderdale, Nassau or George Town, Exumas. In late 1986 a new, expanded airport facility is scheduled for completion, including customs and immigration, light aircraft service and repair, aviation fuel and a cafeteria.

For further information or reservations,

please contact Stella Maris Inn and Estate, 701 SW 48th Street, Ft. Lauderdale, Florida 33315 or phone (305) 467-0466. In the Bahamas write P.O. Box SM105, Stella Maris, Long Island, Bahamas or phone (809) 336-2106. ✈

CA CLEAN UP DAY

Saturday, September 20 is the official California Coastal Clean Up Day 1986. The Greater Los Angeles Council of Divers (GLACD) is asking every dive club to hold a beach dive that day to un-trash the beach. They also are asking every dive charter boat and dive shop class to make one dive a clean-up dive as well.



photo/Jack McKenney

The GLACD will arrange trash pick-up, publicity and even trash trucks at the dock. Just let GLACD know what you're doing, where you're doing it and when you're doing it. Contact GLACD at (818) 846-3256. ✈

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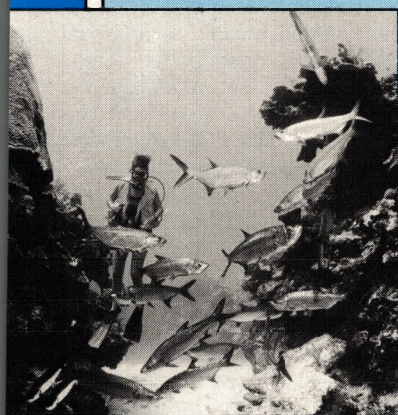
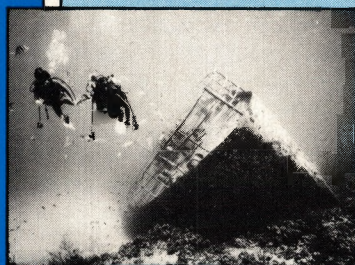
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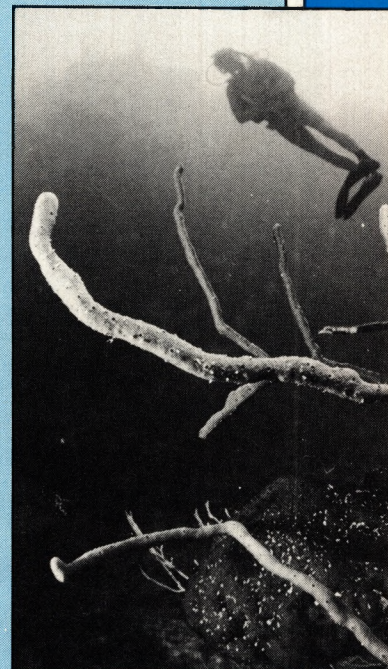
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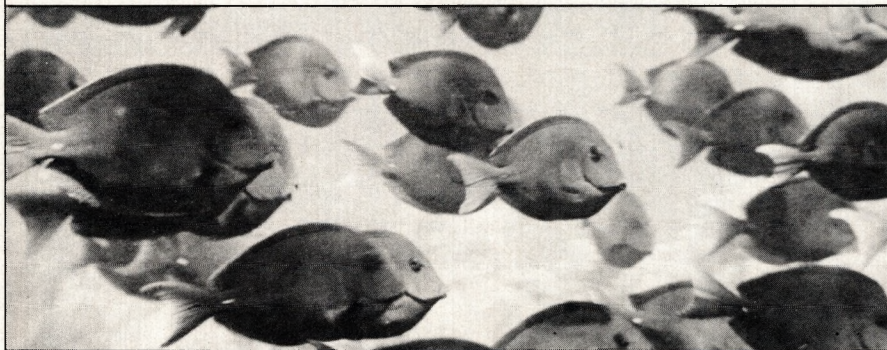
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POSADA DEL SOL

(Continued from Page 90)

four huge mounds in a line and possibly more. Each is like the hump of an unimaginably huge submarine camel, but the geological oddity is that they appear to rise from nowhere and are significantly different than the surrounding bottom. Near the top of each hump is a particular abundance of tropical fish, and it was here we observed a school of at least 18 gray angelfish.

Possibly the most requested dive is Blacktip Dreamland, a vertical wall beginning in 30 to 35 feet of water. It is distinguished by the huge coral cave in the wall face consistently populated by sleeping sharks. The sharks will either be blacktips or bull sharks and they will affect a curious stationary posture with their pectoral fins wedged into the sand. These sharks are very approachable, but the divemasters are strict about asking they not be molested. This dive site is a unique phenomenon and it would be a shame if the sharks deserted the cave because of repeated diver interference.

On the northeast end of the island the dive site known as Volcano is further testament to the geological forces at work in Guanaja. The bottom rises to near the surface from as deep as 70 feet and contains huge grottoes and caves apparently formed as molten lava struck the seawater and solidified. The patterns are surreal and the light patterns within the cave almost psychedelic. Near the surface is a typical shallow reef of elkhorn and pillar coral. Within the caverns beneath are huge schools of copper sweepers, lobsters, groupers, glass minnows, tarpon, blue runners and snappers.

Banzai is outside the barrier reef, running just in front of the hotel. It is typified by a vertical wall face beginning at 40 feet and dropping precipitously to 140. Here an immense spur and groove coral configuration hosts quantities of groupers, jewfish, grunts, cubera and yellowtail snappers, barracudas, jacks, permit, spider crabs and lobsters. At Grouper Grotto the sheer vertical wall breaks up into isolated pinnacles rising from 180 feet to within 40 feet of the surface. Around each pinnacle there is a fascinating array of marine life with several species of grouper, including Nassau, tiger and black always observable. More discussion of specific dive sites would only serve to accent the quality and diversity of the diving potential in this area.

At least once every week Posada del Sol offers a complete around the island trip with two or three dives and a beach barbecue. Not only does this trip open up some of the more distant dive sites, but it also demonstrates how near the windward and leeward coasts of the island are. It would be an unusually foul wind in-

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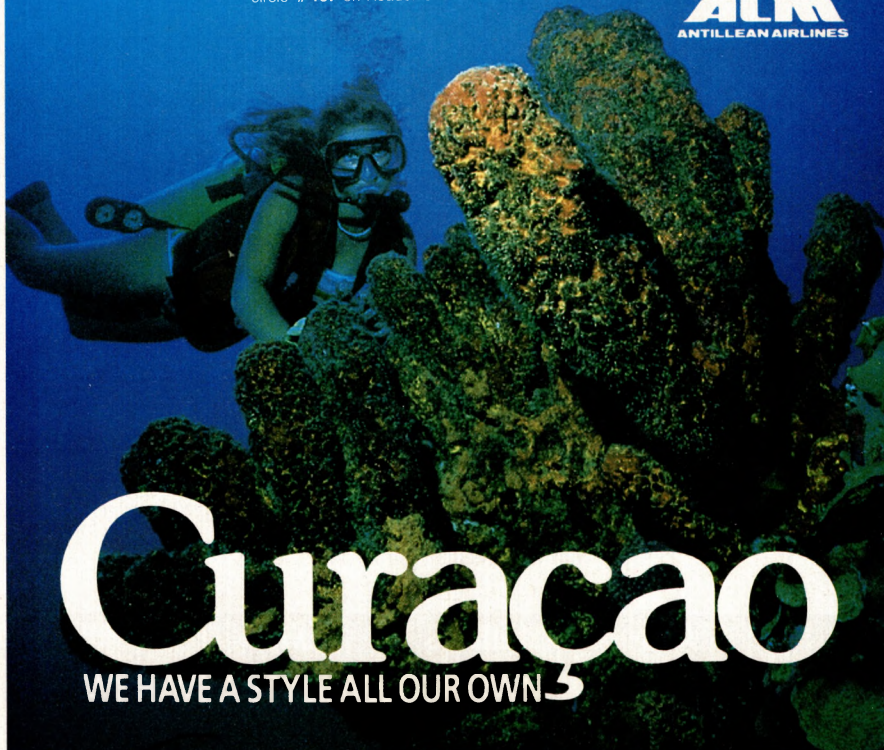
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110 PERCENT DIVER

BY CARL KOHLER

You know you're 110 percent diver if: Secretly, you're more at home underwater than above it.

You envy all the fish and other creatures in your aquarium because they don't have to come up for air.

In your garage, the stacks of SKIN DIVER Magazine are higher than those of National Geographic.

You haven't told your spouse that, someday, you hope to own a pet whale.

You no longer get seasick.

You learned photography underwater and to this day you cannot shoot a decent picture on land.

There is at least one type of wetsuit in every clothes closet of your house.

You know a diver who knew Mel Fisher when he was having difficulty paying the rent on his California dive shop.

Your spouse no longer tells people you're going to be a good diver.

You feel cheated because they might raise the *Titanic* before you have the equipment and the opportunity to explore it where it is.

You settle for one mile of exposed, scattered gold coins and relics on a flat sandy bottom, at five fathoms, in a month of good weather, instead of the *Titanic*.


You pried the first abalone you ever ate from a rock with a borrowed tire iron.

You suddenly realize half your friends are experienced divers and the other half are learning to be.

There is more dive gear in your garage than strollers, cribs, bassinets, pop cans, old furniture, tires, lawn mowers and non-functioning TV sets.


There is still enough space in the backyard to put a new boat between the old boat and the travel trailer.

You find yourself snorkeling or sitting wistfully on your swimming pool bottom because it has been that long since you went diving.

You unabashedly race your spouse to load dive gear into the family truck. 

POSADA DEL SOL

deed to cost a day of diving for the guests of Posada del Sol, for if conditions were adverse in front of the resort, the dive boats could motor behind the barrier reef to a more protected area. Posada del Sol is a comfortably dedicated dive resort and destined to be a winner.

For further information or reservations please contact Inn of the Sun (Posada del Sol), Ltd., P.O. Box 537, Boca Raton, FL 33429 or phone toll free (800) 642-DIVE. Florida residents may phone (305) 944-8554. 

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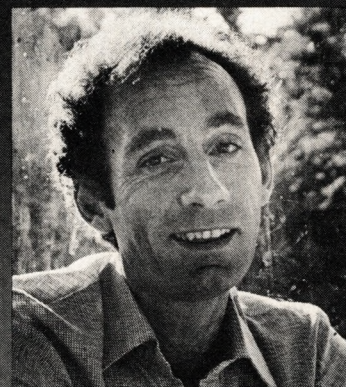
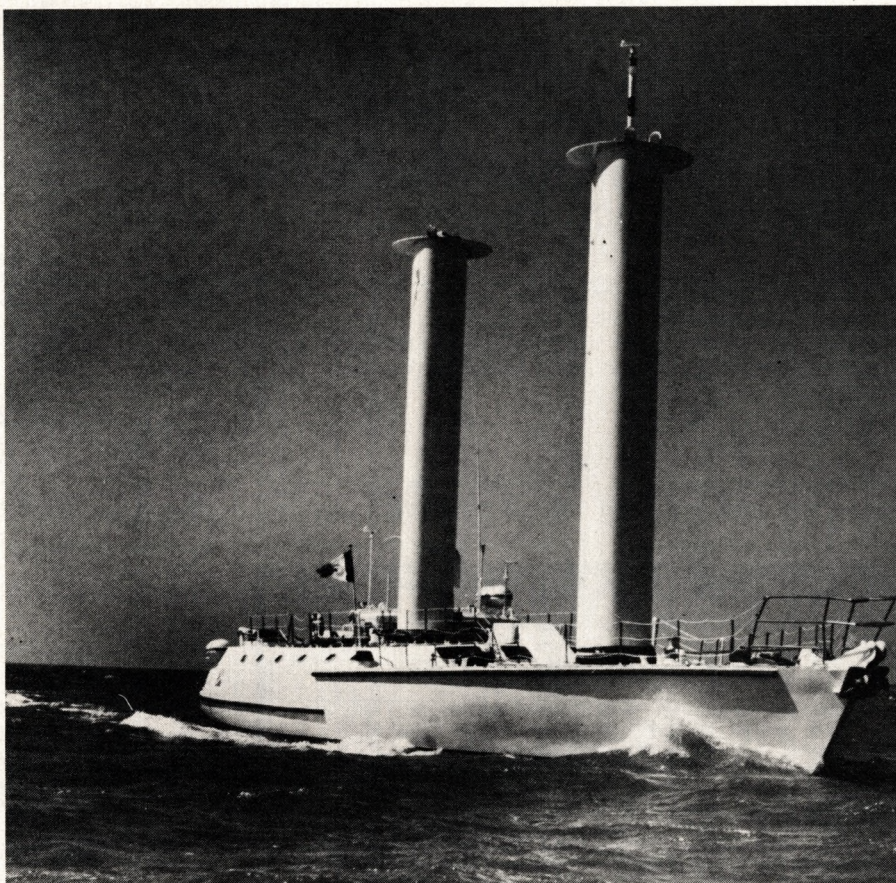
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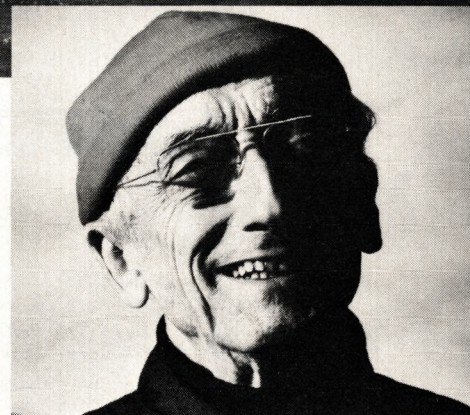
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Louis Prezelin

Around The World With **COUSTEAU**

BY HILLARY HAUSER



Alcyone/Jacques Cousteau

Cape Horn is the Matterhorn of the Ocean, said a cinematographer from Santa Barbara, who was about to round this often violent landmark of the sea a second time. Louis Prezelin, diver and cameraman for Captain Jacques Cousteau, was part of the crew of Cousteau's new windship, *Alcyone*. The windy trip will be aired on television, along with other segments filmed in Patagonia, the Falkland Islands, the Chilean Channel (also called the Strait of Magellan) and Cape Horn.

Prezelin, who lives in Santa Barbara and teaches underwater photography at the Brooks Institute of Photography, recently reflected on his upcoming South American adventure. He said it was to be his second trip aboard *Alcyone*. He recalled the May-June 1985 transatlantic crossing of the revolutionary windship, when he filmed 15 to 20 foot waves breaking over the bow of the boat. One unexpected wave literally swept him off his feet, resulting in a severely sprained

knee that laid him up the rest of the trip. However, Prezelin's footage comprises much of the one hour documentary, *Riders of the Wind*, which aired on television in January this year.

Prezelin remembered, too, the extreme windiness of Cape Horn when he went around the first time, in 1973, aboard *Calypso*. "The wind was blowing 40 to 45 knots or so—that was not too bad," Prezelin said. "Even so, it was very rough. You didn't know whether you should walk on the floor or the walls of the ship."

Prezelin described a 15 foot swell as "calm." "I've seen photos of really rough weather, clipper ships going around in very mean seas," Prezelin said. "Some guys even went around on windsurfers—that must have been a heck of a ride."

Although sailing rough waters in *Calypso* posed no danger, Prezelin said he expected an even smoother sail in the *Alcyone*. "*Alcyone* has been designed like a submarine—stable and safe," he said. "It

should be a good sail." The windship, named for the daughter of Aeolus, Greek god of the winds, is a 100 foot, all aluminum vessel with a wide beam of 30 feet and a very small draft, Prezelin said. It is Cousteau's second windship. The first, *Moulin a Vent* (Windmill), was a 65 foot catamaran of a similar wind propelled design. *Alcyone* has two "aspirated" wind cylinders that look like smoke stacks, where *Moulin a Vent* had one large stack.

The trademarked Cousteau-Pechiney Turbosail system incorporates "aluminum sails" that propel a vessel at speeds of a conventional sailing vessel using sails about four times the surface of the cylinders, according to the Cousteau Society. Invented by the French research team of Professor Lucien Malavard, Bertrand Charrier and Cousteau, the wind propulsion system is now patent pending in all major countries of the world with maritime activities. Essentially, the researchers combined the orientation ca-

(Continued on Page 110)



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BLACKBEARD'S CRUISES

(Continued from Page 85)

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Combine any of these underwater experiences with island exploration, outrageous beach cookouts under starry skies and wholesome food with unlimited draft beer, wine and rum coolers and it adds up to near perfection. It is a delightful procession of eating, diving and exploring that starts all over again each day. Flashbacks and pleasant memories of sailing across turquoise waters with a warm breeze in your face or a nighttime encounter with a huge parrotfish asleep in a coral grotto, will instantly bring a smile to your face once again.

One night each week is planned in port at Bimini or Freeport to provide the island boogie beat—the rest is up to you to improvise. Freeport has several lounges and island entertainment. Bimini is small, rustic and steeped in tales of big game catches and Hemingway memories.

Blackbeard's is a feast for the soul. But more than that, I believe that this kind of diving operation deserves special consideration by advanced and/or those divers opposed to structured trips and well traveled dive sites. In the future, more consideration must be given to experi-

enced divers with individual requests for dive services—and live-aboard operations fill that bill. Take delight in a hypnotic gaze of the cyan world of the Bahamas riding *Morning Star*, *Sea Explorer* or *Pirate's Lady*. Aboard, I have always felt that sense of adventure suggested by Robert Browning's words, "Once more on my adventure brave and new."

For visitors who wish to fly directly into Bimini to join a Blackbeard's adventure in progress, Chalk's Airlines is highly recommended. Chalk's is the oldest continuously operating airline in the world and the white and blue trimmed seaplanes (featured on *Miami Vice*) are a legend.

Packages include all draft beer, wine and rum drinks (after diving please), and all diving/sailing fees. Rental equipment is available and you'll need U.S. money for in-port activities and departure tax.

Interested groups or individuals please contact: Blackbeard's Cruises, P.O. Box 661091, Miami Springs, FL 33266; toll free (800) 327-9600; in Florida (305) 888-1226. ✕

SCUBA SAFARI

Scuba Safari, the dive operation on Grand Cayman Island, is offering free trials of the new Hydrojet. This device operates from scuba tank air pressure and allows divers to cruise at up to twice normal swimming speed while keeping their hands free.

Scuba Safari is also offering special dive packages with accommodations one block from Seven Mile Beach.

For groups of seven divers, one goes free and discounts are available when the dive package and an excursion on Research Submersibles Limited's submarine rides are booked together.

For information call Jeff Kingstad on Cayman at (809) 949-3742 or write Scuba Safari, P.O. Box 2029 Grand Cayman, BWI. ✕

SAN DIEGO UPS

The San Diego Underwater Photographic Society (UPS) is an organization whose members are dedicated to improving their skill in and knowledge of all aspects of underwater photography. UPS activities include group photo expeditions, lectures and the production of the annual San Diego Underwater Film Festival. To help members reach their goals, the organization has available for their use a variety of photo equipment.

UPS membership is open to all who share in the objectives of the society. Photographers and divers who are interested in learning more about membership are welcome at general membership meetings, which are held at 7:30 pm on the fourth Thursday of most months at Sumner Auditorium, on the campus of Scripps Institution of Oceanography, La Jolla Shores. ✕

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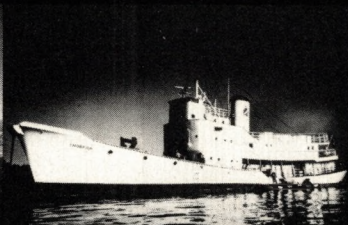
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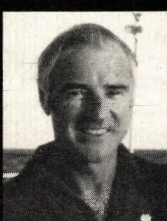
*1986 Skin Diver Magazine reader survey.

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DIVING MEDICINE

(Continued from Page 16)

in the salvage of the U.S. Navy submarine *Squalus* in 1939. The comments from divers and medical officers praising the new gas for the mental clarity and preserved muscle coordination at depths verified the years of research that preceded helium's practical use.


Scuba developed over about 100 years beginning around 1860. A demand regulator was invented by Rouquayrol in that year. This was originally surface supplied with air, but was an essential part of the development of a self contained regulator. There were no high pressure air cylinders at the time, so the demand regulator had to wait 60 years for a metal tank that would hold air at a pressure of 2,000 psi. Early scuba systems were not useful for a number of reasons, but a collection of all the useful ideas was put together by Cousteau and Gagnan in the 1940s to create the Aqua-Lung open circuit scuba. This opened the underwater world to non-professionals and began the sport of scuba diving. Although diving equipment has improved over the years, the basic principle of the demand regulator is still the same.

The most recent advance in diving

came in the 1960s, when several scientists developed the concept of saturation diving. Because inert gas ultimately equilibrates in all tissues with the surrounding pressure, a diver remaining at depth long enough will saturate all tissues. After saturation is achieved, decompression time remains the same for any time at depth. This concept has allowed divers to remain under pressure for more than a month, doing useful work underwater, then returning to a pressure chamber to live between dives. At the end of the dive, the decompression depends only on the depth of the dive and not the time that was spent there. A rough rule for decompression time is one day for each 100 feet of depth, plus one additional day. Thus a saturation dive to 500 feet would require about six days of decompression, no matter how long the divers remained at that depth. Jacques Cousteau, Edwin Link—an American diving scientist—and Capt. George Bond of the U.S. Navy all contributed to the research that made saturation diving a routine procedure in commercial and military operations.

In the last 15 years, we have tested man's limits under pressure with deep diving experiments in France and in the United States at Duke University. At Duke, divers have been to depths in excess of 2,000 feet in a pressure chamber.

This short course on the history of diving leaves out most of the interesting de-


tails of the men who often risked their lives and fortunes in creating the technologic and physiologic advances that allow us to enter and return from the sea safely with reliable equipment that is reasonable in cost and comfortable to use. As divers, we are following a tradition that began more than 2,000 years ago. It will be interesting to witness the next major breakthroughs in diving science. 

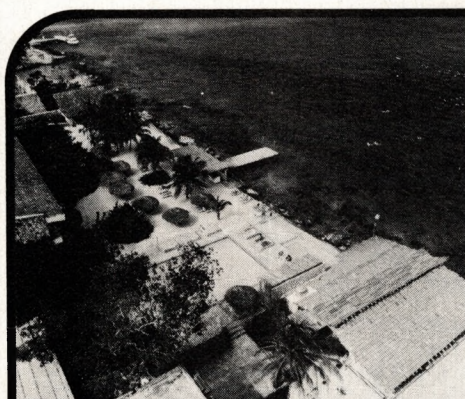
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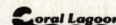
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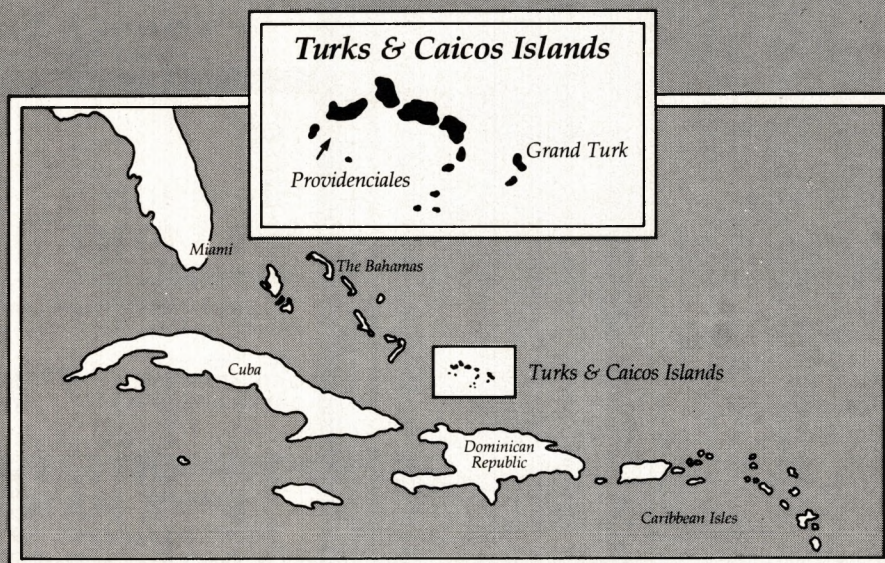
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LOUIS PREZELIN

(Continued from Page 100)

pabilities of a sail with the aerodynamic design of an airplane wing.

The cylinders that propel the *Alcyone* are engineered on a 19th century theory known as the Magnus effect. The effect, named for the German chemist Heinrich Gustav Magnus, is essentially a lift arising from the lateral force of an air current on a cylinder. Moveable shutters exposed to the wind, together with a fan that sucks wind through the vents into the cylinder, provide lift and propulsion for the boat.

Prezelin said the wind propulsion design cuts fuel consumption by almost half. The *Moulin a Vent* was an experimental project to see if the windship concept would work, but during a transatlantic voyage in 1984 the giant cylinder broke off during a violent storm between Bermuda and New York.

The ship was also heavy in the water, Prezelin said. The *Alcyone* was built to combat some of these problems. Pechiney, an international, research oriented aluminum producer with headquarters in Paris, collaborated with the Cousteau group in the building of the second windship, which was launched in March 1985 in La Rochelle, France ("100 miles from my home town," Prezelin said).

The *Alcyone* sailed through the Azores, Bermuda and to New York, with Prezelin aboard, filming violent wave action at the bow. "This ship has outer space technology, very sophisticated," Prezelin said. "It's extremely stable and is designed basically for worldwide cruises. With the wind, you can go anywhere you want."

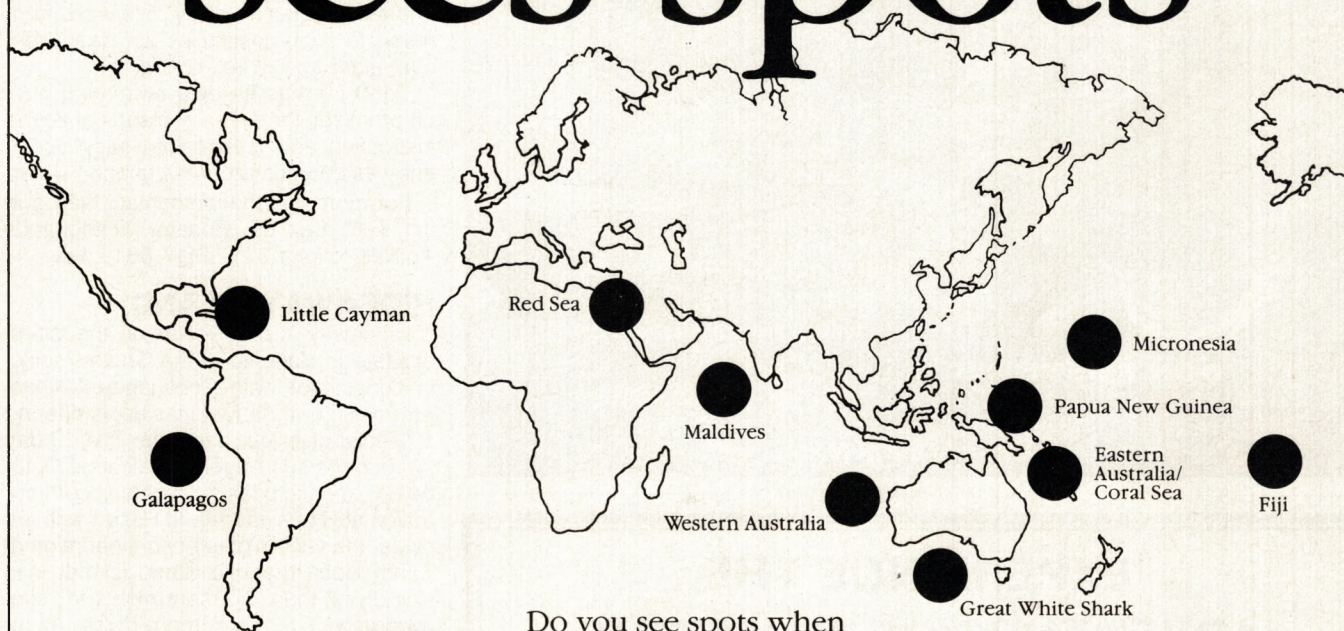
Prezelin said that with the *Alcyone* as its floating base, the Cousteau group planned to document "anything we see that's interesting" during its South American adventure—wildlife, shipwrecks, underwater life and the "human aspects." After rounding Cape Horn, the sailors traveled north up the west coast of South America, where they revisited spots they documented in 1973 from *Calypso*.

"We'll do a followup on stories we made at the time," Prezelin said. In particular, cameras will focus on the fate of 27 Alakaluf Indians, who were dying out from "white man's diseases and poor treatment by the Chilean government," he said.

"The channel is very beautiful, but depressing," Prezelin said. "It rains all the time, is cold and overcast—very windy. The last time, we were there for five weeks and there was never more than three days that we saw the sun. Even our Chilean guide said, 'We don't know where we are.' We got very moldy."

Prezelin said the *Alcyone* will be a key attraction at the Expo '86 World's Fair in Vancouver, B.C.

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CARIB INN

Jim Surber has joined the staff of Carib Inn on Bonaire as an instructor. He is a PADI master instructor, a NAUI instructor



and will conduct a variety of courses from resort to such specialties as: deep, rescue, night and wreck diving.

Carib Inn has its own swimming pool on premises for the early stages of scuba instruction and features an easy ocean entry as courses progress to open water.

For more information contact the Carib Inn, P.O. Box 68, Bonaire, Netherlands Antilles; phone 011-599-7-8819.

HIDEAWAY ISLAND

Hideaway Island Resort on the island of Efate in Vanuatu in the South Pacific, in conjunction with Continental Airlines, Air Pacific and Air Melanesiae, is offering a special dive tour package. The 13 day trip departs Los Angeles, California October 26 and includes six nights accommodation at Hideaway Island Resort with ten dives, then two nights accommodation at Santo Hotel (Espirito Santo Island) with four dives, then two more nights at Hideaway Island with two more dives. All air fare, including interisland connections, is provided in the package price. Meal plans are optional and nondivers receive a discount.

For information phone Hideaway Island Resorts, Ltd., Melbourne, Australia (03) 509-9423 or, in Sydney, (612) 29-5814.

SEA OF CORTEZ

A journey is planned to explore Sea of Cortez reefs, a wreck, sea lion rookery and El Bajo from aboard the 50 foot *Rio Rita*. Participants will stay at Los Arcos Hotel in La Paz where it will be easy to shop in the many native markets and dine in the fine restaurants.


Leading the tour will be Joe Dorsey, U/W photographer, lecturer and adventurer who has more than 30 years of diving experience and David Carey, an Eastern School of Skindiving instructor.

The trip leaves Baltimore October 5 and returns October 12.

Information is available from Eastern School of Skindiving, care of Divers Den, Inc., 8105 Harford Rd., Baltimore, MD 21234; (301) 668-6866 or Sea Safaris, 3770 Highland Avenue, Suite 102, Manhattan Beach, CA 90266; (213) 546-2464 or (800) 821-6670.

CORAL SEA


Departing October 17, Tropical Adventures Travel has exclusive charter of Australia's most spacious and stable live-aboard dive vessel, the M/V *Watersport*. The Australian Television Network has already booked space for its filming crew. Following final production, the film will be shown on national television throughout Australia and then utilized for promotional presentations throughout Australia, New Zealand and the U.S. The 15 day itinerary will include diving the Great Barrier Reef, the Outer Coral Sea, plus two full days on the wreck of the *Yongala*.

To take part in this diving adventure contact: Tropical Adventures, 170 Denny Way, Seattle, WA 98109 or phone (206) 441-3483. 

BONAIRE SCUBA CENTER PACKAGES

The Bonaire Scuba Center, at the 148 room Bonaire Beach Hotel, now offers complete air and land packages to the resort through its reservations office in the United States.

Round trip flights between Miami or New York and Bonaire are via ALM Antillean Airlines. The land portion includes private air-conditioned accommodations at the Bonaire Beach, a Copthorne Hotel resort; round trip airport transfers in Bonaire; welcome cocktail; \$5 casino chip in the hotel's Black Coral Casino; two complete meals daily; unlimited tennis and mini-golf; plus all hotel taxes and service charges. Packages are available for any number of nights. Watersports add-ons range from snorkeling packages and learn to dive courses through unlimited boat and beach diving and specialty training courses for certified divers.

For more information and reservations, contact the Bonaire Scuba Center Reservations Office, P.O. Box 775, Morgan, New Jersey 08879; (800) 526-2370. In New Jersey call (201) 566-8866. 

KONA PHOTO COURSE

Chris Newbert will teach an underwater photography course at Kona Village Resort on the big island of Hawaii October 27-November 2. A seven day package includes the complete course plus lodging at the Kona Village in a moderate-category "hale" (house), all meals, round trip Kona Airport ground transportation, portage, all other resort gratuities (except beverage), Hawaii state tax and a graduation cocktail party. Nondiver rates also are available.

Newbert has won more than 30 awards in international underwater photographic competitions. His first U/W photographic book, *Within a Rainbow Sea*, has won awards and acclaim from the photographic and publishing communities.

For more information about the course and to make reservations, call Kona Village Resort toll free at (800) 367-5290. In Hawaii, call (800) 432-5450. 

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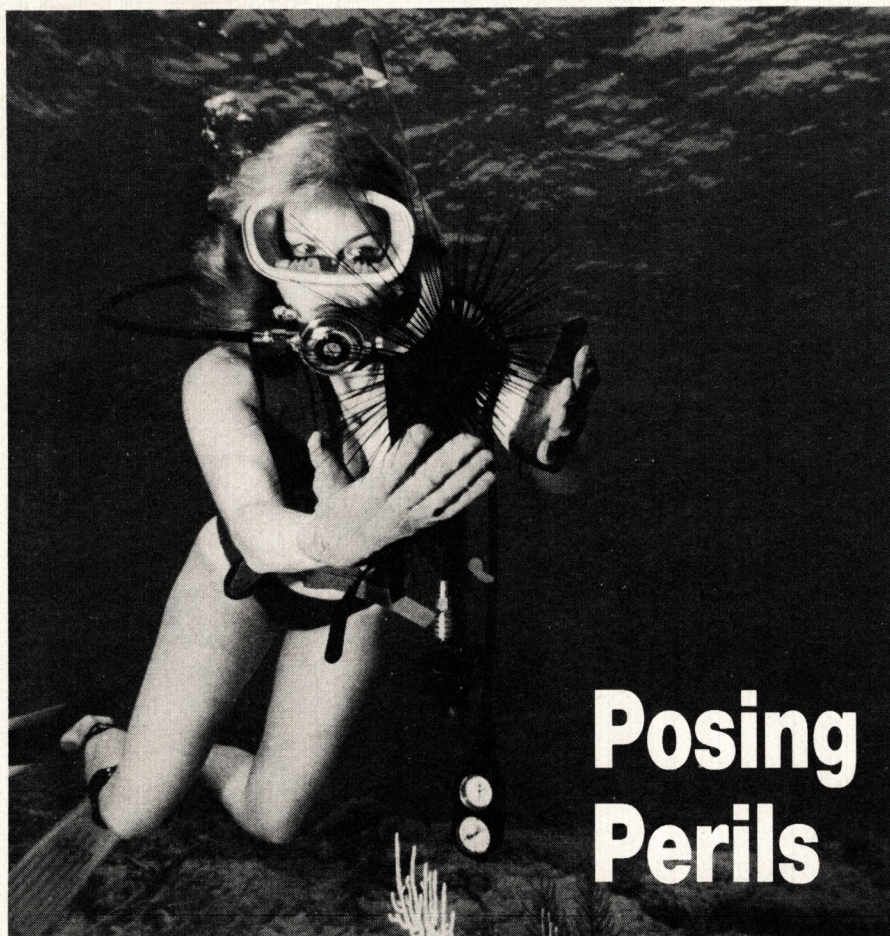


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Posing Perils

The Unglamorous Activity of U/W Modeling

BY SUZANNA J. HALL

Modeling has often been regarded as a very glamorous vocation. Yet it is the painter, the sculptor or the photographer who, through his work, will long be remembered and exalted. Who remembers the long hours of discomfort and discipline his subjects must have encountered on the way to *his* immortalization? I cannot classify myself among the greats in underwater modeling history, but I have done my share and I feel it's time for someone to speak up for the unsung artisan—the model.

One need not be extremely attractive to be a good subject. However, you do need complete command over your every move, picturing in your mind each angle of your physical whole. Many times this entails tolerating minor discomforts until the project is complete. I have been able to maintain my composure, even after having been directed through a cave of stinging coral. (At least until I was within striking distance of the photographer!) When working with wildlife, it is necessary to be in position when the animal is. All too often, the ideal position occurs just as an exposed part of my anatomy has

Photos/John F. Hall



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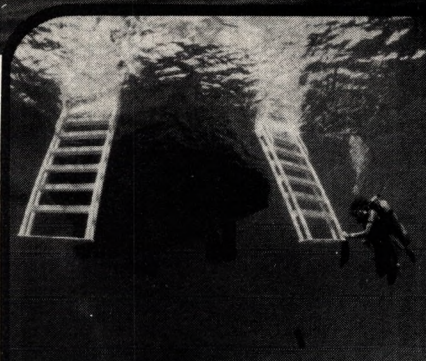
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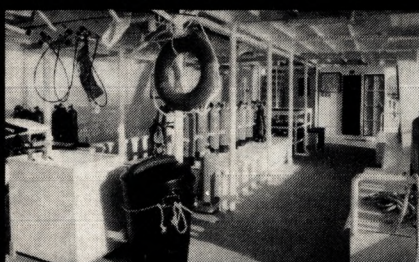
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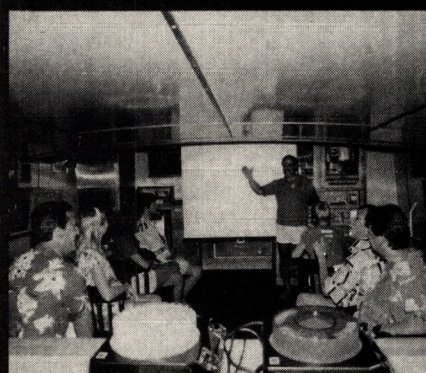
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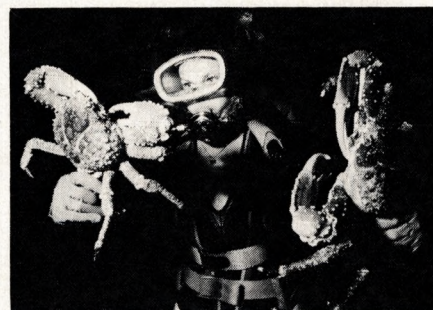
ROATAN/ BAY ISLANDS

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POSING PERILS

had a run-in with a prominent branch of fire coral. Tears moisten my eyes, but not an emotion is revealed until after the official OK is received.

One of the potential hazards of U/W modeling is the likelihood you will be expected to handfeed fish. I have, all too often, been enveloped in the frenzy that ensues. Many times I have held out a treat only to quickly discover it was considered an open invitation to a more substantial meal—perhaps a hand sandwich! Once I felt I had guaranteed my safety by intentionally leaving behind the food meant for such an event. Everything was going smoothly—I was substituting hand motions for the real thing—and I felt as if I were really pulling the wool over their eyes. John, my husband and chief photographer, began his gyrations covering all workable angles. Suddenly, I was pulled up and backward from my knees.



Underwater model Suzanna Hall poses with two crabs—holding them carefully.

One of the larger groupers had grabbed my pigtail and was trying to abscond with it. Another grouper immediately took the cue. I felt his impact on the right side of my head. My mask flooded and I began the frantic task of clearing my mask and trying to free my braid.

Within seconds the commotion died down. My rescuer was not my sweet husband, but Jack, a dear friend of ours and one of John's fellow photographers. Later I expressed my gratitude for the help. "That's okay, I was out of film anyway," Jack told me.

Usually, I am sufficiently adept at the handling of marine life (at times downright cocky). On one certain dive, this could have cost me something very near and dear to me. We had just caught a sea turtle. My mask began to leak profusely, which called for a few adjustments and removal of the water. I tucked the turtle securely under my arm and went about my task. As I was expelling the last drop of water, I noticed John waving frantically. With sounds and signals I let him know I knew what I was doing and that I had a firm grip on his subject. What I didn't realize was that the subject was trying to get

a firm grip on my right breast. John explained the meaning of his gestures later. I now pay close attention to his warnings.

As a team, John and I try to absorb every bit of information we can get our hands on concerning marine life. We enjoy hearing the finer points of handling certain species, trying to avoid the wear and tear that comes from trial and error. One evening, as we sat watching a slide presentation given by our friend and dive-master, Don, I was given two methods of securing a giant reef crab to help us in our night diving series. It sounded easy.


I put the theory to work the very next night. In pitch black waters, I saw this huge creature zero in on me, eye-level,

claws out front, ready to pounce. I was relieved to discover that Don, emerging out of the darkness, had a firm grip on the back of this gigantic crab. Then it became evident I was expected to take it over and control the crustacean for the camera. I quickly reviewed my choices, then maneuvered my hand in back of the crab grasping its shell, with thumb on top and the remaining fingers securely in place underneath. Don cleared the staging area and I positioned my mask slightly over the top of the crab's shell, as directed. Out of my view, the creature's immense claws began their rearward journey to the source of its restraint. Just as I was beginning to feel comfortable with

the whole situation, I felt a sharp pain in my fingertips. I withdrew my hand and began slinging it ferociously, knowing all too well what had transpired.

After examining my glove to assure myself its contents were still intact, I became enraged to see Don retrieving the monster. Before long, however, I once again had this killer thrust in my face. This time, I examined the exact hold Don had on the crab. Reaching out slowly, I pinched its two hind legs together. This was sufficient to render the crab completely immobile—and I could do with it as I pleased!

Other divers enjoy themselves pursuing their own interests, frolicking about the ocean bottom without a care. I spend my dives hovering over a crevice or steep wall, letting the photographer do with me as he pleases. Who has time for play, anyway? Sometimes I have to literally beg John to put away his wide angle and bring out the macro, because that is when I really have my fun. I poke and pry and search for those marvelous little treasures that lie hidden in the corals, so that someday they too might have a chance of becoming a centerfold.

If you someday see a photo of a female diver alongside a great white—be assured it won't be me! But, long after they have taken away my regulator I will reminisce and remember my small contribution to the world of art. 

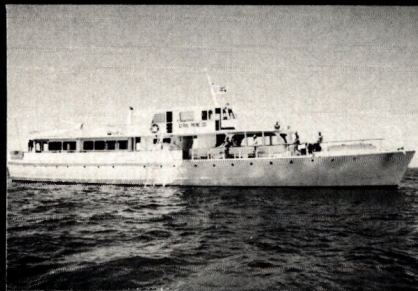


Poseidon Ventures

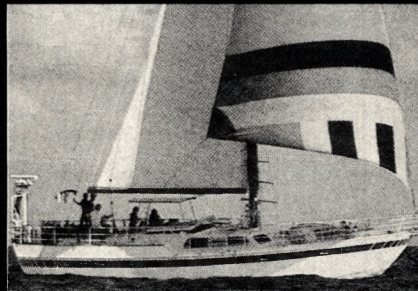
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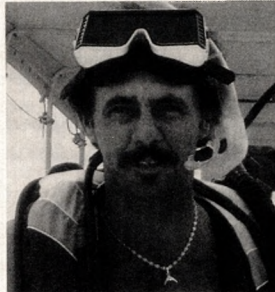
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BONAIRE DIVE BOATS

Two new custom designed and custom built flattop, monohull dive boats have been delivered to Peter Hughes Divi Bonaire at the Flamingo Beach Hotel & Casino. The vessels, *Joyce W.* and *Alice H.*, were built to Hughes' specifications by the Fayne Limbo Boat Company of Palmetto, Florida. Constructed on a Holiday Mansion Barracuda Hull and powered by twin V8, 170 hp G.M. diesel engines, the boats are capable of speeds up to 40 knots and glide gracefully even in the roughest offshore waters.

The services of Marine Island Products, Inc. were used for the construction of the specialized aluminum roof structure, railings, camera tables, benches with built-in scuba tank racks and boarding ladders.

DIVI HOTELS UPGRADE

Divi Hotels' Tiara Beach Hotel, Cayman Brac, recently installed its own freshwater plant and has removed the turtle grass from its beaches. The two faceted improvement program was an effort to better serve guests. The \$50,000 drinking water plant produces up to 6,800 gallons of water per day. Tiara is also installing new plumbing fixtures in the rooms to complement the desalination plant.

Owing to the removal of turtle grass from the beach fronting the hotel, there is now a large, clean, white, sandy beach for guests.

The resort also has another custom designed dive boat, the *Ocean Fever*. The new 40 foot *Ocean Fever* is powered by twin V8, 350 hp diesel engines and is capable of speeds up to 30 knots. The efficient offshore hull accommodates up to 20 divers comfortably.

Reservations and information can be obtained from recognized travel agents or Divi Hotels Executive Office (607) 277-DIVI, or toll free (800) 367-DIVI.

ROYAL ISLANDER

All new, one week vacation packages are now offered by the Royal Islander Club & Hotel, Honolulu. The most significant change in all packages is the sharp price reduction from previous plans.

Sport packages are still emphasized in the Royal Islander's new programs. Diving packages provide three or four days of diving, eight days/seven nights hotel accommodations, airport transfers, two days use of a rental car, welcome breakfast and "aloha" room setup.

The Royal Islander is in Waikiki at 2164 Kalia Road, directly across from the beach at Ft. DeRussy Park, on the corner of Kalia and Saratoga Roads. Phone (808) 922-1961; reservations U.S.A. (800) 367-8047; in Canada (800) 423-8733.

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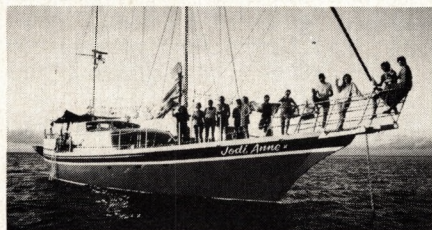
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LA MER/ WESTERN AUSTRALIA

La Mer Diving Seafari, Inc. is now offering diving in the Rowley Shoals atolls. These are 170 miles off the northwest corner of the Australian continent.

The program operates in August and September only, to take advantage of the best conditions in this remote corner of the Indian Ocean. The program includes




photo/Amos Nachoum

two nights in Perth and 10 days of unlimited diving on board the luxurious 70 foot ketch, *Jodi Anne*.

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For further information, contact La Mer Diving Seafari, Inc. at 823 United Nations Plaza, New York, NY 10017 or call (800) DIVE-NOW or (212) 599-0886. 


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Contact Key West Reservations Service, P.O. Box 1452, Key West, FL 33041. Phone toll free (800) 327-4831 in the U.S., (800) 356-3567 in Florida. From Canada call (716) 823-1061. 

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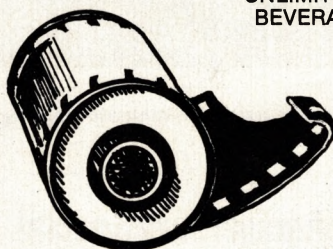
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KEY LARGO MARINE SANCTUARY

Southeast of the Florida peninsula, where the Keys begin their extension into the Gulf of Mexico, lies one of nature's oldest and most artfully crafted gardens: the Key Largo National Marine Sanctuary. Formed over thousands of years, this is the largest coral reef system of the North American continent.

A comprehensive management plan has been developed by the NOAA Office of Ocean and Coastal Resource Management. In general, NOAA regulations permit both sport and commercial fishing with hook and line. Spiny lobsters and stone crabs may be taken in accordance with fishery management regulations.

Swimming, snorkeling, scuba diving, photography and recreational boating are encouraged. Also, important scientific research takes place within the sanctuary.

A number of activities are regulated to ensure the health and well being of all the resources found on the coral reef and associated habitats. These include: 1. Removal or destruction of natural features, marine life (except for the take of spiny lobsters and stone crabs) and archaeological and historical resources; 2. Dredging, filling, excavating and building activities; 3. Discharge of refuse and other pollutants; 4. Tampering with markers, mooring buoys and scientific equipment; 5. Use of spearguns and wire fish traps; 6. Damage caused by watercraft and boat anchors; and 7. Handling and standing on the coral formations.

Violators of these regulations are subject to civil penalties.

LA STREGA CORRECTION

The address and telephone number published for *La Strega* in the Belize Travel Guide (June 1986) was incorrect. The correct contact is Hugh Parkey, P.O. Box 678, Belize City, Belize, Central America; telephone 011-501-2331. Information may also be obtained through *La Strega's* U.S. office; 5818 Green Falls Drive, Houston, Texas 77088; phone (800) 433-DIVE.

CAYMAN EXPRESS

Cayman Express will repeat its winter charter series. The 1986/87 season will feature weekend departures from New York, Chicago, Detroit and Philadelphia. In order to accommodate its expansion, Cayman Express has moved into new, larger headquarters.

For information on package trips to the Cayman Islands write to: Cayman Express, 684 Brookhaven Circle West, Memphis, TN 38117; or call (800) 247-9900, in Tennessee (901) 767-0140.

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COZUMEL OXYGEN

Cozumel, Mexico, an island lying just off the Yucatan Peninsula, is a mecca for scuba divers, including thousands from Houston, Texas. While diving accidents are infrequent here, they do occur from time to time. Because of this, Bruce Langston, president of Texas Scuba, Inc., a two store retail scuba diving training facility in Houston, has organized a fund raising drive to place oxygen kits on Cozumel dive boats. Contributing the first \$100, Texas Scuba mailed out a call for donations in its monthly newsletter. In all, \$1,800 was collected. Texas Scuba was then able to purchase ten portable oxygen kits.

Langston and Texas Scuba's Montie Ballantyne delivered the kits to the mayor of Cozumel in a ceremony last July. Langston and Ballantyne also delivered ten green (for life) flags with fluorescent orange oxygen symbols to be attached to the boats carrying the kits so boats without oxygen have an easy way to identify those that do. These flags were contributed by Texas Scuba. >

CAYMAN AIRWAYS/ATLANTA

Cayman Airways now flies from Atlanta to the Cayman Islands. The inaugural flight took place in May. The event was marked by a flag raising ceremony held outside the international terminal at the Atlanta airport and also by a ceremony held at the Cayman Airways gate on the international concourse. >

CENTRAL PACIFIC DIVERS

Central Pacific Divers, 780 Front St., Lahaina, Maui, Hawaii 96761, has recently installed a toll free telephone line. For information on interisland dive charters and reservation service call toll free (800) 551-6767. >

CELESTIAL SALVAGED

Out Island Divers has saved a six month old trawler/yacht from the barrier reef. Grounded solidly just north of the Belize/Mexico border, the *Celestial* sat atop the reef for two weeks and survived a tropical storm despite considerable hull damage. The insurance company surveyed the wreck and wrote her off as a total loss.

Out Island Divers, however, bought the salvage rights and converted their dive boat, *Reef Roamer II*, into a rugged salvage vessel. When the *Celestial* was finally refloated, the *Reef Roamer II* towed her 70 miles to Belize City where permanent repairs are now underway.

The *Celestial* is expected to be in operation this month. Built in Taiwan with teak work throughout, the 44 foot *Celestial* can accommodate up to eight live-aboard divers and will increase Out Island Divers' capacity for atoll dive excursions to Lighthouse Reef and the Blue Hole. >

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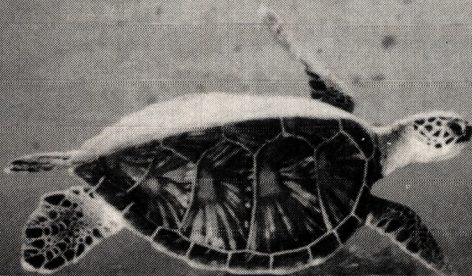


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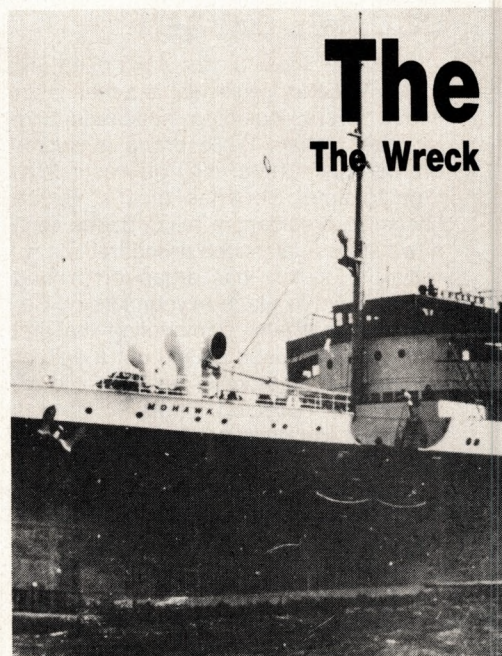
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The The Wreck



TEXT AND PHOTOGRAPHY
BY CHUCK ZIMMARO

The date was January 25, 1935. It had been snowing heavily for several days on the East Coast from New York to Delaware. The temperature was down to the single digits and the wind chill factor well below zero. But, for 53 people the weather conditions seemed more of a nuisance than a hardship. These people were arriving at the Ward's Line East River pier at the foot of Wall Street in New York. They had booked passage on the passenger vessel, *Mohawk*, scheduled to leave later that day to carry them on a Caribbean holiday.

By mid-afternoon the snow had stopped and at 4:00 pm the mighty 402 foot long SS *Mohawk* weighed anchor and headed out to sea. Besides her passengers, she carried a crew of 110 and 1,286 tons of miscellaneous cargo bound for Havana, Progreso and Vera Cruz.

After passing Sandy Hook at 5:35 pm, and before heading south along the coast of New Jersey, the *Mohawk* paused for more than two hours while her radio compasses were adjusted.

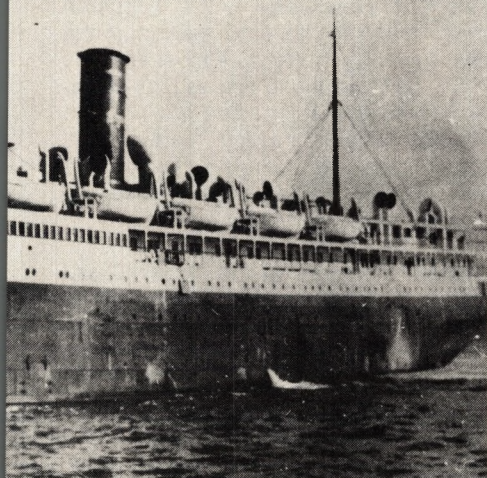
While the temperature was only 5°F, the weather along the coast was almost perfect. The sea was smooth, the crisp, cold air without a hint of fog. Those passengers strolling the decks could easily see the lights of Sandy Hook only four miles away.

The *Mohawk's* master, Captain Joseph E. Wood, concerned it was taking so long to adjust the compasses, left the bridge to speak with his radio operator, James Gueff. He was unaware his ship's running and marker lights were not functioning properly. Less than five miles away, the Norwegian freighter *Talisman* was quickly approaching from the stern.

The *Mohawk* was a relatively fast passenger liner. She could normally steam at

Mohawk

That Shouldn't Be



18 knots with no difficulty. The delay was putting her behind schedule. Captain Wood knew the shipping company's officers would not appreciate this deviation from the timetable. Passenger liner companies were extremely competitive and although most of the services and amenities on all the other liners were nearly the same, speed was one of the differences. Delays could cost the company thousands of dollars in future cargo and passenger contracts.

The *Talisman*, a much slower vessel, had left her pier at 30th Street in Brooklyn at 5:00 pm and had reached Sandy Hook by 7:08 pm. She was bound for Claymont, Delaware to load additional cargo for Bahia, Brazil. If the *Mohawk* hadn't had to stop she would have easily been 25 miles ahead of the *Talisman*.

Captain Wood returned to the *Mohawk's* bridge and ordered the engine room full speed ahead while giving the helmsman a heading that would move the vessel slightly farther offshore.

On the bridge of the *Talisman*, the helmsman saw the white lights of the shore towns to his right and noticed slightly brighter lights ahead of him but no green or red ship's running lights. The white lights did not seem to be getting any closer and since the night was clear, he passed them off as just bright lights from shore. Some of the *Mohawk's* passengers were huddled on the stern deck behind the lounge. They noticed the bright green light of a ship's starboard running lamp quickly approaching from the stern and off to their seaward side. Surely, they thought, the other vessel could see them and would safely pass them on their port side. They went back inside to warm themselves and listen to the orchestra.

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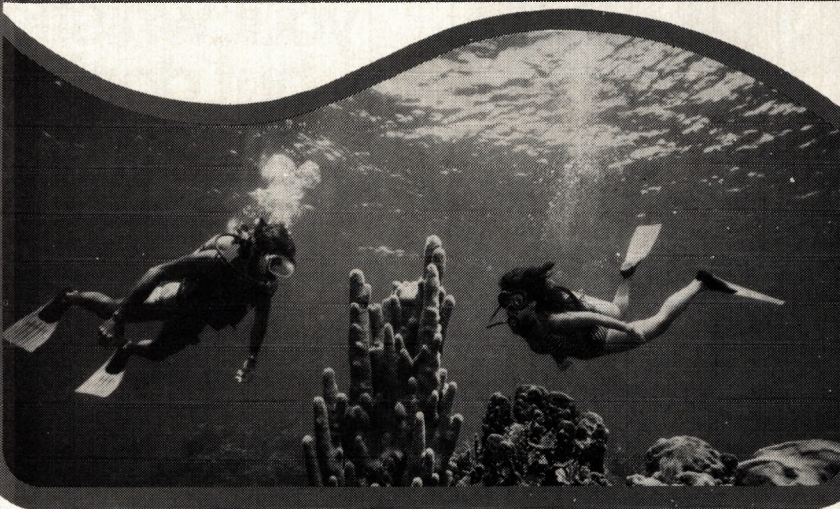
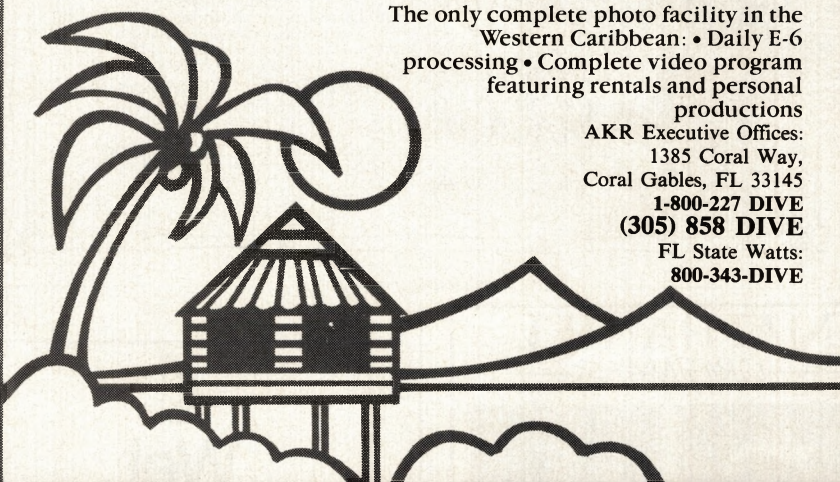
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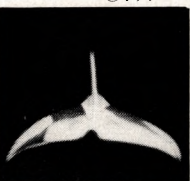
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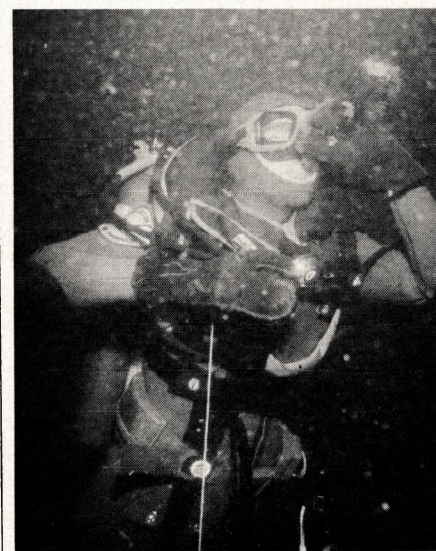
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THE MOHAWK

Shortly after 9:30 pm, eight miles off of Sea Girt, New Jersey, the *Talisman* crashed into the forward section of the swiftly moving *Mohawk*. Almost instantly the *Mohawk* swung to port as tons of water poured into the gaping wound. The *Mohawk* was still making headway and every minute she moved forward, more water rushed into her, causing her to list almost immediately to port.

For U.S. Coast Guard radioman J.J. Puhlick, stationed at the Coast Guard Station at Cape May, New Jersey, it had been a quiet watch: just the usual static over the wireless and an occasional transmission from a vessel to a shore station. Then, at 9:39 pm the silent airwaves erupted: Both *Mohawk* and *Talisman* sent out urgent SOS signals. Puhlick intercepted them, acknowledged them and relayed them to the Deal Beach Coast Guard Station in North Jersey. They, in turn, passed these onto the headquarters



During a low visibility dive on the *Mohawk* a diver poses with an encrusted bottle. The 402 foot long passenger liner sank off New Jersey in 1935 after being rammed.

of the 5th Naval District in New York. New York requested two cutters to report their positions, then to proceed directly to the collision site. The United Fruit Company *Limon*, which had passed Sandy Hook 20 minutes after the *Talisman*, was only a short distance away. She flashed word immediately that she was responding to the SOS. So did the Clyde-Mallory liner *Algonquin*, bound for New York from Jacksonville, Florida, also in sight of the stricken vessels.

Back on board the *Mohawk* near panic broke out. Many passengers, clad in nothing more than nightgowns, frantically tried to locate loved ones and put on life vests. They pushed and shoved their way

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up to the boat decks. Some of the passengers jumped from the stern of the *Mohawk* as crew members tried frantically to lower lifeboats. One unfortunate crewman was crushed to death beneath the lifeboat he was trying to swing free. Several lifeboats could not be launched because they were frozen to the deck. Passengers tried to cut away the falls with penknives. First class passengers Mr. and Mrs. John Talfer with their two sons, Clyde, three months, and Ian, eight years old, from Edinburgh, Scotland, rushed through the crowds desperately trying to get into one of the lifeboats. Realizing there was not enough room for all of them, they put the children in this boat and decided to look for another means of escape and rescue for themselves. As the boat was being lowered, Clyde and his brother were thrust into it. They were found huddled in fright, hardly noticed by the others, when the *Algonquin* picked up the survivors. The body of their father, John, was recovered by the cutter *Icarus*, but their mother's body was never found.

By the time the armada of rescue vessels arrived on the scene, they found the *Mohawk* listing so badly to port that the usable lifeboats were swinging freely from the davits. Many of the passengers and crew had to jump for their lives from the slanted deck of the liner to the swaying lifeboats. Some made it and some did not. Other lifeboats had successfully been lowered. Those who used the oars suffered blistered skin and had patches of skin peel off their hands, which froze to the oars. Some of the survivors told stories of seeing bodies in the water, while others heard the screams of people trying to stay afloat.

The *Talisman*, in the meantime, had drifted off slightly and after a quick inspection, radioed the Coast Guard, "Bow damaged, but in no need of assistance." She stood by to render assistance to the rapidly sinking liner. Along with the other rescue vessels on the scene, she had trained her search lights on the *Mohawk*, but before the last boat was lowered, the moon rose high in the night sky and lit the rescue scene brightly. Radio messages flashed back and forth among the *Mohawk*, rescue vessels and the Coast Guard shore stations for nearly an hour. At 10:23 pm Coast Guard radioman Puhlick monitored the last message to come from the *Mohawk*: "No orders from captain. Think that we are going to abandon ship. Very bad list." With that, Gueff signed off and went to the lifeboats.

Captain Wood, still on the bridge, wondered how this could have happened on such a clear night. There was precious little time left. He called on the engine room to give him whatever power they had left and ordered the helmsman to steer hard to starboard. This was an attempt to bring the stricken vessel closer to shore and beach her in shallow water to prevent her total loss. It was no use. The engine

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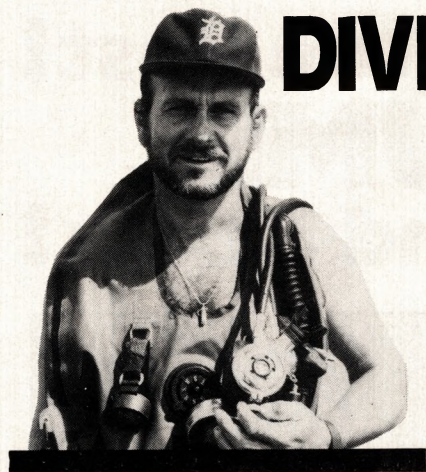
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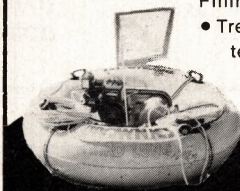
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THE MOHAWK

rooms were already flooded. Without engines, the reserve batteries were quickly drained. The vessel started to turn to port. After releasing the rest of his crew from their duty stations, the captain walked out onto the bridge wing. Two survivors stated they saw him on the bridge as the *Mohawk* finally slipped beneath the silent, jet black, 80 foot waters. The cutter *Icarus* sent the radio epitaph, "*Mohawk*, rolled over, sank! Am picking up survivors."

The rescue vessels remained on station for almost two hours in an attempt to locate more survivors. At 1:30 am, the master of the SS *Limon* radioed the Coast Guard, "The distress emergency is well in hand. Radio traffic may be resumed as usual. Am heading to port with *Mohawk* survivors."

Of the passengers and crew, 33 were dead and 13 were missing.

After the *Mohawk* sank, her stacks and masts broke the surface, making her a menace to navigation. The Navy blew her up and cleared the wreckage to within 55 to 60 feet of the surface. Even though the *Mohawk* has been visited for many years, she is far from being picked clean. Personal items, tiles, bottles, old automobile tires and axles are still easily found. Also, several record tautog and sea bass have been taken from this wreck. Occasionally, a porthole will come up. Silver utensils or brightly decorated pieces of china or dinnerware with the Clyde Line emblem can still be recovered from the galley.

1984

The sun had not yet risen over the eastern horizon when the first set of divers started arriving at Hoffman's Marina in Brielle, North New Jersey, where Captain George Hoffman moors his 36 foot fiberglass hulled dive boat *Sea Lion*.

This day, ten members of the Abington Sub-Mariners of Ambler, PA would be diving several of the numerous shipwrecks that lie just a few miles offshore. One of these would be the *Mohawk*.

Less than an hour after leaving the dock, the engine slowed and a buoy was thrown to mark the remains of the once mighty liner. It wasn't long before the anchor was dropped and my buddy, Mike Butterworth, and I hit the water. The surface temperature was a relatively warm 74°F and the visibility 25-30 feet. We passed through a thermocline at 55 feet and the temperature dropped from 72° to 65°F. Visibility was about 40 feet. We swam toward the bow. Sea anemones covered much of the wreckage, making identification of many items practically impossible. Soon we were in the bow section. We could see schools of tautog and sea bass gliding lazily over the wreckage, keeping just out of reach.

Several small and medium sized flounder shot up from the sandy area below us and disappeared into the light, lime green haze. I swam over the remains of some winches and lengths of chain, looking under some wreckage for lobster but finding none. Mike swam over to a section of the bow that was intact. As he went through a doorway that once was the entrance from the forward main deck to the interior of the liner, I photographed him.

All that remains of this area is 8 to 10 feet of intact hull, so we continued our exploration. Farther back along the wreck, I was startled to see a skate cross my path. I stopped to photograph a half-buried brass porthole backing plate, caught under some wreckage. Every time I'm here, I can't help but tug on it, hoping it will come loose and knowing it won't. No doubt, nearly every diver tries it.

I looked over to see Mike dart down a hatchway head first, leaving just his legs and fins exposed above the wreck. He slowly withdrew, holding up scallops! I joined him in his search.

Since there was room for only one diver in the hole, I searched the surrounding area. Instead of finding scallops, something caught the beam of my dive light and reflected it back to me. There, under a ledge, was a medium sized rectangular bottle. Once I had it, I turned it around and wiped it off. The inscription read, "Dr. Bell's Pine Tar Honey for Coughs and Colds."

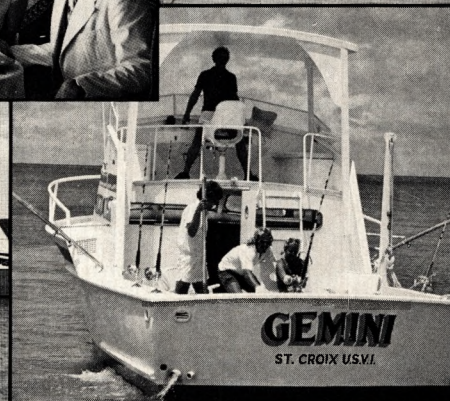
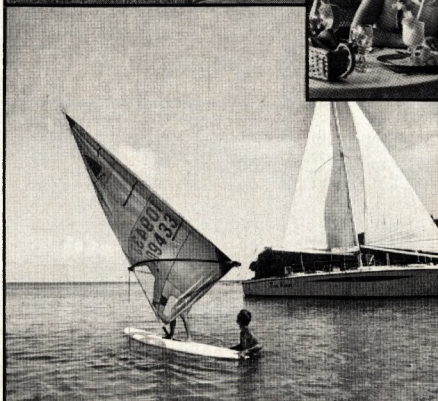
Mike and I continued our swim to the middle of the wreck, where our anchor was, since our bottom time was growing short. While looking for lobsters to photograph and catch, we swam over the remains of old automobile tires and axles. A variety of marine growth was present on the wheels and tires and fish of many types darted in and out.

After taking some final photos, I signaled Mike our time was up. At the anchor line, I saw a silver colored saucer sticking out from some overgrown wreckage. Excitedly, I reached down and pulled it out. The disk was about one foot in diameter, bowed in the middle, and covered with all forms of sea growth. My mind raced as I tried to figure out what great treasure I had uncovered.

Rising through the thermocline into warmer water felt good, as did the increased surface light. Once on the surface, we swam back to the ladder and I let Mike get into the boat first. I carefully handed up my camera, then with equal care, my goodie bag.

I carefully opened my bag and pulled out my "dish." Was it perhaps a silver serving plate or a large chrome soup dish? I wiped it off and flipped it over. There in the middle of the back, was the familiar Chevrolet emblem. Instead of a priceless serving plate, I had recovered a 1935 Chevy hubcap. Mike and I both laughed. As we moved off, I let the hubcap slip over the side of the boat.

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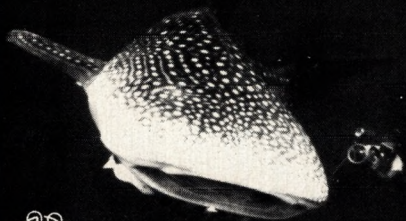
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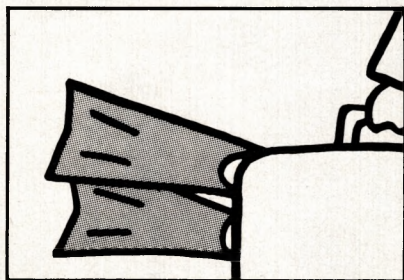
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CORALS

A Key To The Brain

Scientists Study Simpler Genetics
Of Marinelife For Clues About
Human Functions

BY HILLARY HAUSER

One of the simplest of sea animals
may soon unlock deep and compli-
cated mysteries of the human brain:

Speaking of a \$50,000 honorarium he
recently received from the Smithsonian
Institution, UC Santa Barbara marine re-
searcher Daniel E. Morse said the sim-
pler genetic processes of marine animals
are providing clues about the more com-
plex physiological functions in humans.
(Working out of the Smithsonian Tropical
Research Institute, Morse will lead a team
of researchers in a microscopic look at
corals for two years.)

Morse, a professor of molecular genet-
ics and biochemistry, said that by focus-
ing on corals—one of the very simplest of
multi-cellular animals, scientists may find
a key to improving the diagnosis and
treatment of disorders in the human
brain. The key, he said, is the way marine
animals rely on chemical signals to con-
trol critical phases of their development.
One of the very unique and beautiful fea-
tures of life in the ocean is that the larvae
of many marine animals drift in the plank-
ton until they recognize some chemical
signal that triggers the act of settling.

This process involves what he has
termed "signal molecules" and the func-
tioning of these molecules has parallels
in human physiology. In the ocean, a sig-
nal molecule enables each microscopic
larvae to find a suitable environment in
which to grow up. An example of this pro-
cess is found in the red abalone, which
does not settle out of the plankton cur-
rents until it receives a chemical signal
emitted from red algae, Morse said. A
signal emitted from the algae triggers the
larval abalone to drop out of the plankton,
where it not only finds a suitable habitat
(the rocks on which the algae is grow-
ing), but also the algae itself, which is a
necessary food.

The process—although relying on dif-
ferent signal molecules for each marine
species—is one that closely resembles
the nerve function in the human brain,
Morse said. Noting the strong interaction
between chemical signals from the algae
to nerve cell receptors on the larvae,
Morse said his researchers have also
learned that the same signal molecules

from the marine algae can bind very selectively to receptors on the nerve endings in the mammalian brain. He said corals may ultimately lead to understanding the complex "wiring system" of the human brain.

"It may be possible for us to dissect the mechanisms by which the signal molecules control development in these simpler animals," he said. "In turn, this would guide us in our search for mechanisms by which chemicals in the brain could control development of the nervous system." Morse said his group will explore the possibility of genetically engineering a variation of the marine molecules that will be used for "improved diagnosis of brain disorders." The molecules could be used in the newly developed non-invasive procedure called positron-emission tomography, or PET-scan—which requires "specific molecular probes for different areas within the brain," Morse said. He added the molecules may be useful for "more effective treatment of brain disorders—with fewer side effects than presently possible."

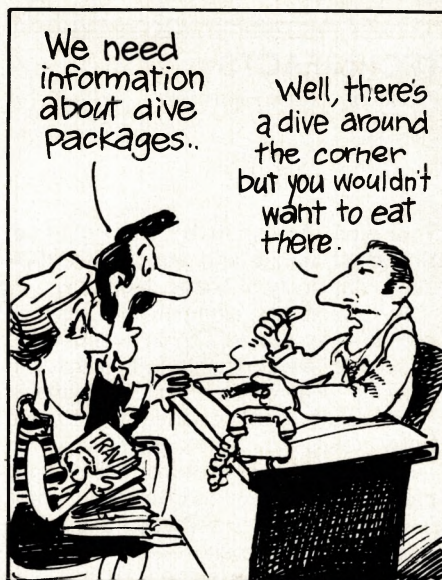
Morse said his research group is collaborating with biotechnology industrial groups in California to develop useful applications of its findings. "What we've discovered in marine animals is really exciting and has specific applications to human medicine," he said. "It's not surprising to us that medical discoveries and medical products come from the sea."

Morse has received international recognition for his work in identifying the molecular mechanisms controlling the reproduction and growth of shellfish. Although his marine research has always been aimed at questions of human physiology, spinoffs of it have resulted in mariculture techniques now used by commercial seafood growing companies.

One of Morse's projects resulted in the discovery that abalone could be induced to spawn and settle by adding hydrogen peroxide to seawater.

The flip side of this research coin led to the discovery of a natural method that blocks the settling process—a discovery that has proved valuable to the U.S. Navy Office of Naval Research. The Navy spends millions of dollars every year to remove marine organisms from the bottoms of its vessels. In January, Morse led an Indo-U.S. Binational Symposium in India, which focused on the control of marine larval settlement.

While his research has practical applications for mankind, Morse said the discoveries made by his scientific team also contribute to an understanding of the marine ecosystem itself. A spinoff of his research in Panama will be greater knowledge about the ecology and development of corals. "These organisms represent one of the most ancient and highly diversified communities on earth, yet the corals themselves are developmentally and genetically among the very simplest animals in existence," Morse said.



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TECHNIFACTS

(Continued from Page 50)

This was published by the Rosentiel School of Marine and Atmospheric Science, University of Miami, Miami, FL.

Both sport and commercial divers, as well as all fishermen, should accept these manmade environments with appreciation and with certain definite obligations. The scientific study of artificial reefs is a fairly new field. Scientists who place reefs need every bit of information they can get from divers and fishermen about the increased, or, perhaps, decreased populations of the sites. John Naughton told me, "There is no real reason why divers and fishermen should not use the sites. But they should help us determine the usefulness of them by reporting the species and sizes of their catch so we can determine the productivity of each."

According to Robert A. Grace, professor at the Department of Civil Engineering, University of Hawaii and one of the authors of Chapter 11 of *Artificial Reefs*, the most important things a sport diver can do to contribute to the artificial reef programs are to:

"1. Make detailed notes on what features of an artificial reef appear to be particularly effective in attracting and holding specific fish species. These should include such features as horizontal extent, vertical rise, layering, size and number of openings, roughness or smoothness of surfaces, benthic organisms and notes comparing the artificial reef with the nearby natural bottom.

"2. Discourage and report the use of illegal fishing methods.

"3. Report, with details, instances of wave or surge damage to natural fish habitats, such as the vast destruction to natural habitat by Hurricane Eva in Hawaii in 1982.

"4. Report, in detail, instances of damage or movement of artificial reef structures as a result of surge or storm waves.

"5. Report to fisheries departments the availability of clean construction materials that, when properly placed offshore, might provide artificial reef material.

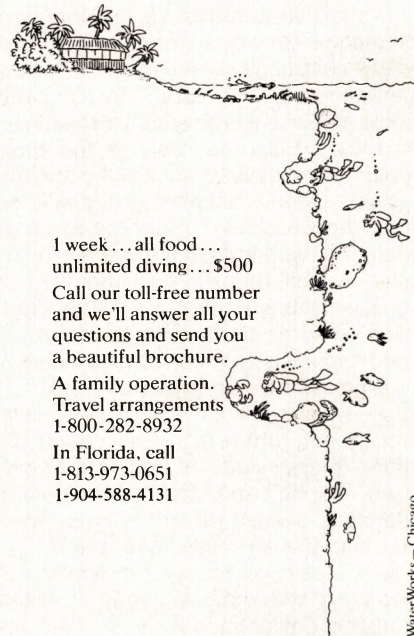
"6. In groups, such as dive clubs, volunteer their services in areas of inadequate fish resources to fabricate, deploy and monitor suitable artificial reef structures." Note: It should be kept in mind the deployment of artificial reef material must, in all cases, be done with permits from appropriate government agencies.

"7. Keep away from, and help keep others away from, special test artificial reef areas."

Professor Grace also stressed, as did John Naughton, that all divers and fishermen should report the species and number of fish taken from artificial reefs,

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Technifacts would like to thank John Naughton and Professor Grace for their help in compiling information and photographs for this Technifacts. Also, I would like to hear from readers throughout the world about diver contact and experience, whether good or bad, with artificial reefs of any kind or with any other kinds of fish aggregation devices, whether surface type or submerged. How do you feel about the employment and use of such structures? Let all divers make every year the year of the ocean.

OLD DIVING FILMS

My thanks to John T. Nelson, Stow, Ohio; Bob Click, Washougal, WA; and R. Dane Looman, Gales Ferry, CT, for their help with films. The *Wake of the Red Witch* was filmed in 1948 and starred John Wayne, Gail Russell, Luther Adler, Gig Young and others. It ran 106 minutes. Another film readers brought to mind was *The Frogmen*, starring Richard Widmark, Dana Andrews and others. It was made in 1951 and ran for 96 minutes. Also, *Reap the Wild Wind*, starring John Wayne, Ray Milland and, possibly, Susan Hayward, was filmed in the 1940s and featured hardhat diving in a search for treasure off Jamaica. Milburn Stone, a young bit player in this flick, went on to become the crusty old doctor in the television series *Gunslinger*. *The Wreck of the Mary Deare* starred Gary Cooper and Charlton Heston in a scuba diving adventure involving a freighter, murder and lots of intrigue.

One reader mentioned the series of creature movies: *The Creature from the Black Lagoon*, *The Return of the Creature*, *The Creature Walks Among Us* and *It Came from 20,000 Fathoms*. The latter film, made in the 1950s, according to the reader who wrote, is so bad it is actually funny. The story involves a mutant octopus that grows and grows, etc. from the effect of A-bomb tests in the Pacific. It gobbles up seaside resorts for lunch. Bob Click said, "It was not intended to be a satire but was anyway." He added, "It does have some real good underwater photography of octopuses."

Many of these films, while fictional, played an important part in the popularity and, probably, the early development of sport diving and equipment. Some, probably most, of these oldies can be found in the corner video rental libraries. If not, these places can possibly obtain copies for rent. The major list of old underwater films appeared in SDM last December. Thanks to all SDM readers who have expressed an interest in this fascinating aspect of sport diving.

Send comments, suggestions, photos or questions to me: c/o SKIN DIVER Magazine, 8490 Sunset Blvd., Los Angeles, CA 90069.

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CESSNA RECOVERY

They Said It Couldn't Be Done

BY RUSTY LOWRY

The article in the local paper said that it couldn't be done: The single engine airplane, which did an emergency landing a week before in the Potomac River, probably would not be salvaged. My partners and I thought differently—as we pulled away from the pier before dawn in a chartered fishing boat loaded with spare tanks, an air compressor and three enthusiastic divers.

The story started a week earlier: The single engine Cessna, on an instrument flight from Ohio to the local Navy base at Patuxent River, Maryland, experienced an engine failure and crash landed in the Potomac River about a mile and a half from shore. The pilot landed the plane in the water and got out through the back cargo door before it sank. He was picked up by a local fisherman and then taken by helicopter to the Navy base hospital.

I heard about this on the radio. Since I work as an engineer on the base, I went to the hospital to talk to the pilot. He was not hurt, though pretty shaken up. And, he was very receptive to my proposal to dive on his plane and recover his briefcase and personal equipment.

The following morning Dan, my diving buddy, and I were on our boat heading for the site. The pilot had given me a rough description of where the plane was and said the fisherman who picked him up had dropped a marker there. Since the Potomac River is more than five miles wide at that point, I shouldn't have been surprised when, after two hours of a crisscrossing search pattern, we hadn't seen any sign of the aircraft or its marker.

At this point we decided to dock the boat and call a friend who was a pilot as well as a diver. Soon Pete was flying over the river in a small plane while we followed in our boat below. In 15 minutes Pete spotted a narrow gasoline slick and followed it up the river. There was our airplane! Pete started circling almost one mile north of our original search area and we hurried to the spot.

When we got near, we could see the plastic milk jug the fisherman had used to mark the wreck and small bubbles of gasoline coming to the surface every few minutes. We quickly anchored the boat, got our dive gear ready and went over the side.

The Potomac is not known for good visibility, but that day it was not too bad with large objects visible at about five to six feet. We descended to the bottom at 25 feet and discovered it consisted of

three to four inches of soft mud over a harder, sandy base. We then established a circular search pattern and slowly glided off, a couple of feet above the bottom of the river. After a few minutes of searching, a large object loomed up ahead of us. We had found it! It was a Cessna 206, one of the larger single engine aircraft currently built. It had a high wing over the cabin and nonretractable landing gear. The big Cessna could seat six people and weighed about 2,000 pounds empty. The aircraft was resting on its nose and right wingtip with the tail sticking up at about a 30 degree angle.

We had previously agreed not to enter the plane until we could discuss its condition on the surface, so we attached our own marker to the plane and set about examining the outside. It was soon apparent very little damage had been done to the airplane, with only a few dents and a broken windshield showing. Even the three bladed propeller was unbent, resting in the soft mud of the river bottom. You could see the pilot's briefcase and extra clothes floating inside the cabin, suspended against the rear windows.

Dan and I surfaced to plan our entry into the aircraft. Small planes are not spacious inside and this one had seat belts, shoulder harnesses and loose gear littering the cabin. Because of this, one diver would enter the plane and the other would stay at the door to help if needed. We went back down and opened the large cargo doors at the rear of the cabin, tying them open. Then I went inside and passed all of the loose equipment to Dan. After getting the pilot's gear out, we took some pictures of the airplane, both inside and out, and got out of the water.

After returning the gear to the appreciative pilot, Dan and I began to talk about the plane. As an aerospace engineer, I was quite familiar with the fact that a lot of wrecked aircraft are damaged more during recovery than they are by the crash in the first place, especially those that sink. Typically, aircraft are raised from the water with cranes that lift them clear of the water before it has a chance to drain out of things like the wings and fuselage. This results in many pounds of water being trapped in the structure and tearing the fragile metal apart when the plane is lifted. It seemed a shame for this to happen, as our airplane was in such good shape. Knowing something about both diving and aircraft structures, we decided we could salvage the plane without tearing it up.

Because of a holiday weekend, it was Tuesday before we could get in touch with a representative of the insurance company responsible for the plane. After several phone calls we found we not only had permission to raise the aircraft, but we had bought it as is, where is, on the bottom of the river. Needless to say, the price was right! We quickly set about preparations for the recovery.

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CESSNA RECOVERY

We knew we would need help so we asked Pete, the pilot who had helped us earlier, to join us again. We also contracted with a local charter boat captain, Bob Bowes, for his services, which included the 35 foot wooden boat *Audrey B.* We assembled air tanks, a gasoline powered air compressor, 100 feet of air line and two dozen tractor trailer tire inner tubes and loaded these on Bob's boat.

A light rain was falling as we pulled away from the dock in the early morning darkness. By 6:00 am we were anchoring at the wreck site and readying our dive gear. Dan and I would attach the inner tubes to the airplane and Pete would remove inspection panels from the plane to let water drain out more easily.

We entered the water and found the visibility down to four feet, but everything else was about the same. Most importantly, the aircraft was in a good position, having shifted onto its main landing gear. A quick look showed the wheels to be only five to six inches deep in the mud.

We quickly started bringing the inner tubes down to the wreck. We had removed the valve stems from the tubes the night before and squeezed every bit of air out before putting the stems back in. Even so, the tubes wanted to float off constantly. Dan and I tied them together in groups of three and encircled the wing with them in four places. We also put two groups around the nose and tail of the plane. Pete was busily removing inspection panels, antennae and anything else he could get hold of! He really looked odd working away with a screwdriver and wire cutters while lying on his back in 25 feet of muddy water.

After changing to fresh tanks and starting the air compressor, Dan and I returned to the water for the main event. We attached a tow line to the nose gear of the airplane, dug the mud away from the wheels and made sure Bob had his boat clear of the area directly above the plane. With Dan holding the air line and me the tubes, we started to fill them, systematically putting small bursts of air into each tube to balance the load. We figured we had approximately double the buoyancy the plane would need to float and we didn't want to overdo it.

Slowly the plane began to move. First one wing rose slightly and then, as we put another burst of air into the other wing, the whole thing began to rise majestically from the bottom. It was an incredible feeling of satisfaction to see the airplane float slowly and steadily toward the surface. The air in the tubes expanded some as the water pressure lessened on the way up, but the large surface area of the aircraft kept the rate of ascent very low as it pushed its way up through

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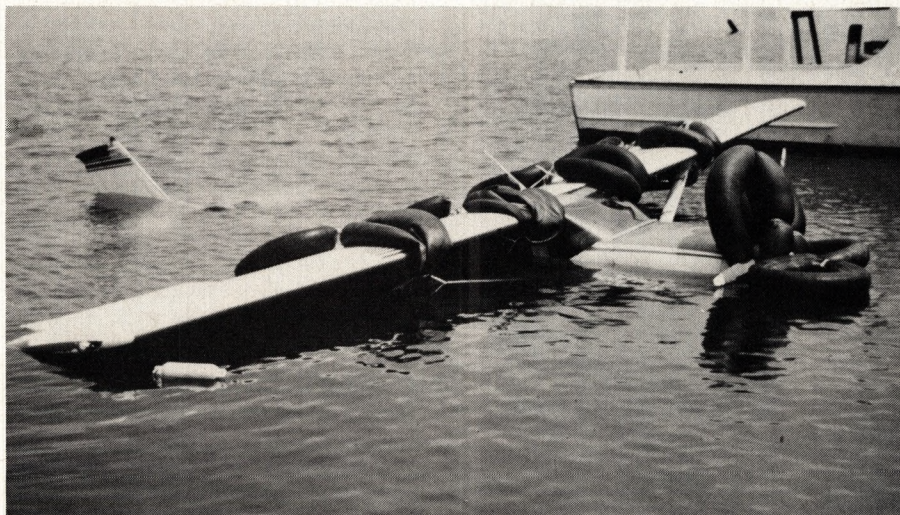
the water.

At 9:00 am the boat party let out a shout as the Cessna, after a week on the bottom of the river, bobbed to the surface, with two excited divers swimming around it. We finished filling the inner tubes and attached several more before climbing back onto the boat for breakfast and the ride home.

We were still on the ride home when we ate lunch. The combination of a rising tide and the high drag of towing an airplane through the water conspired to make the six mile trip back to the dock last five hours. We finally got to the marina and were met by a representative of the local newspaper (we had called them

It was crucial to take the aircraft apart and flush it out with fresh water as soon as possible in order to keep the corrosive effect of the brackish water to a minimum. At last the aircraft was loaded on a flatbed trailer for its trip to the airport and we retired to the marina bar to join the crowd of spectators in a number of well deserved beers.

The next week was hectic as the Federal Aviation Administration, The National Transportation Safety Board and the engine manufacturer got very interested in our plane—now that it could be inspected without donning a pair of fins and a mask. It was all worthwhile, though: A week after the recovery we sat at the airport and



Above: The Cessna 206 after it was floated with inner tubes and towed to shallow water. Below: The Cessna (wings removed for transport) is trailered to the airport.



photos/Rusty Lowry

on the radio), a number of patrons from the marina bar and the state police. They were extremely interested in finding out if we had permission to recover the plane and wanted some proof! We finally convinced them to let us get the plane up out of the water by pulling it up the marina boat ramp (on its own wheels) before we trooped off to a pay phone to call the insurance company. Convinced at last, the police joined the growing crowd of spectators watching us work on the airplane.

watched our plane going out the gate on another flatbed truck—heading for an aircraft repair facility in Michigan. Not only had we sold the airplane for a healthy profit, but the article in that week's paper had brought smiles to all of our faces: "We said it couldn't be done, but a group of local divers proved us wrong, recovering a ditched aircraft from the depths of the Potomac River with apparent ease." We may have lied to them a little about the apparent ease. ✈

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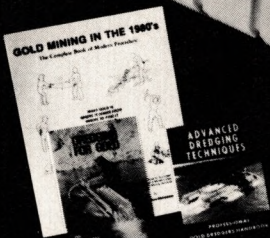
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FLORIDA DIVER TRAINING

The Florida State Legislature ended its 1986 session without taking action on a bill that would have placed diver training under the control of the state-sponsored Board of Scuba Instruction. The bill, SB 532, had been introduced by State Senator Bob Johnson, (R), of Sarasota, Florida. It was similar to a bill that Senator Johnson introduced during the 1985 legislative session—which did not pass.

The bill, if passed, would have required state licensing of diving instructors, assistant instructors and instructor-training schools. It also would have allowed the Florida Department of Health and Rehabilitative Services to establish standards for compressed air sold to divers.

Members of the diving community had expressed opposition to the bill. Among these was PADI, which enlisted former Florida Speaker of the House Ralph Haden to act on its behalf.

In opposing the bill, PADI cited University of Rhode Island statistics showing that diving and diver training continue to become increasingly safer under the current self-regulatory system.

CHAMBER COURSE

Local sport divers and diving professionals are learning lifesaving chamber operations at the College of Oceanengineering in Wilmington, California.

The course teaches sport divers to recognize pressure related injuries, set up a decompression chamber for a treatment, pressurize, regulate and depressurize a chamber, treat pressure related injuries, manage oxygen treatment and learn how to be an inside chamber tender.

The course includes two optional chamber dives—one to 112 feet with an oxygen tolerance test and one to 165 feet teaching nitrogen narcosis management.

The weekend course is open to certified sport divers. For additional information, contact Tommy Thompson or Judene McBrien at the College of Oceanengineering (213) 834-2501.

ATLANTIC ALLIANCE PROGRAMS/EVENTS

Nearly 40 shipwreck diving enthusiasts discovered underwater archaeology is not a "dry" subject while attending the Atlantic Alliance archaeological research assistant workshop. It was held at the 16th annual Our World Underwater Conference in Chicago.

Designed to give divers an appreciation of the need for proper archaeological exploration of our maritime heritage, the course included both lecture and hands-on practical experience within the controlled environment of a pool. It was taught by archaeologist, R. Duncan Mathewson III, well known for his work with Mel Fisher on the *Atocha*.

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The Atlantic Alliance for Maritime Heritage Conservation, a Washington, D.C. based organization, is dedicated to the educational programs that provide training for sport divers who wish to become involved in meaningful and productive projects. The Alliance has regional directors who set up area workshops and arrange projects, often with state archaeologists. Future projects include the October 13-18 Mullica River project in New Jersey and the September 26-28 Pennekamp survey in conjunction with Koblack Marine Resource Center in Key Largo. The 3rd Annual Convention of the Alliance will be held in Atlantic City, New Jersey, October 17 through the 19.

A new, 24 hour hotline has been established for the Alliance. The Alliance's number is (202) 231-3666. If you have questions concerning any of the Alliance's programs, need an update concerning shipwreck legislation or just want to find out more about Alliance activities this number can help.

For more information write: The Atlantic Alliance for Maritime Heritage Conservation, Post Office Box 27272, Central Station, Washington, D.C. 20038. ✉

VOLUNTEER DIVERS NEEDED

The Long Island Sound Taskforce of the Oceanic Society is conducting a study of Western Long Island Sound that requires visual observations of bottom life. The data sought includes bottom type, depth, temperature and presence or absence of certain marine animals.

After minimal training, sport diver-volunteers will be asked to fill out a form at the end of each dive and mail it to the Taskforce. Interested sport divers should call (203) 327-9786. ✉

SPEARGUN RECALL

Scubapro is recalling its Magnum Pneumatic Spearguns owing to a possible problem that could cause them to fire without warning. The recall affects all models and sizes of the above gun. If you own one of these spearguns, do not use it. Return the gun to any authorized Scubapro dealer or the factory at 3105 E. Harcourt St., Rancho Dominguez, California 90221. Repairs will be made free of charge and the owner will receive a complimentary one year subscription to Diving and Snorkeling Magazine. ✉

NATURE VIDEOS

Pacific Arts Video is offering video tapes made from episodes of The Undersea World of Jacques Cousteau. The series features four episodes: The Smile of the Walrus, A Sound of Dolphins, The Singing Whale and the Unsinkable Otter. At this writing, six additional episodes were to be released this fall.

For information contact Pacific Arts Video, 50 North La Cienega Boulevard, Suite 210, Beverly Hills, CA 90211; (213) 657-2233. ✉

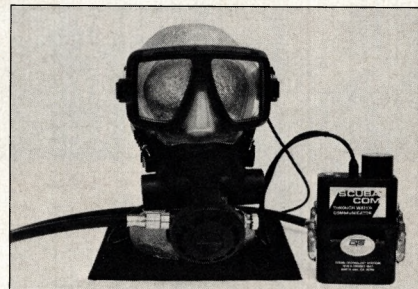
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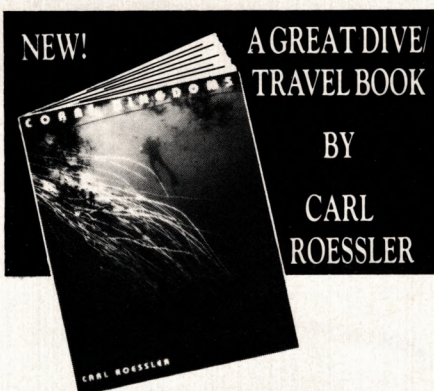
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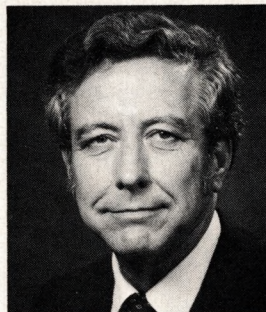
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DAVIS HONORED

Jefferson C. Davis, M.D., has received the 29th University of Missouri-Columbia (UMC) Medical Alumni Citation of Merit. Through this award the UMC Medical Alumni Organization honors one past graduate each year for outstanding achievement in the medical profession.

Dr. Davis is director of hyperbaric medicine at Southwest Texas Methodist Hos-



pital in San Antonio and adjunct professor of preventive medicine at the University of Texas School of Public Health in Houston. He is widely recognized as a pioneer in hyperbaric oxygen therapy. Through this innovative therapy, he uses oxygen pressure to treat a wide range of conditions, from problems caused by rapid changes in pressure for divers or aircraft pilots to carbon monoxide poisoning and serious wounds and burns.

Davis was a member of the first graduating class of UMC's four year medical school in 1957. While in the Air Force he founded the USAF Hyperbaric Medicine Center, served as vice commander of the Aerospace Medical Division at Brooks Air Force Base in San Antonio and received the Air Force Association's Scientist of the Year award. He has also served as president of the Undersea Medical Society, president of the Aerospace Medical Association and president of the American College of Preventive Medicine.

NAUI COLLEGE STAFF

George Bodinar has been appointed aquatics director at NAUI College. He will, in addition to his instructional duties, be responsible for coordinating all open water and pool training at the school.

Additionally, NAUI College has appointed Katrina Corman administrative assistant. Her experience includes a background in law.

NAUI College is in its eighth year of operation, offering training for advanced divers, instructors and career candidates. Interested parties are encouraged to contact the school offices at 27402 Camino Capistrano, Suite 103, Laguna Niguel, CA 92677. The number to call collect, toll free, is (714) 582-0186 or, outside California, (800) 423-7095.

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WATERMAN/WEST POINT

Cadet Lisa Elsesser, president of the Cadet Scuba Instructor Group, recently presented the U.S. Military Academy plaque of appreciation to Stan Waterman



after his afternoon seminar and evening program at the famous military academy.

Waterman was also honored on the islands of Barbados and Antigua, where he presented two fund-raising programs in support of the decompression chamber newly established on Barbados.

Eleven of the classic Waterman films are now available on videocassettes. For information contact Waterman Films, 16 Hunter Rd., Princeton, NJ 08540.

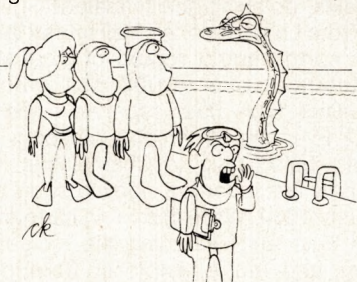
AQUANAUT INSTRUCTORS

On May 22, Capt. Bob Lindstrom and Capt. Clifford Rassweiler returned to the surface after spending two days living on the ocean's floor. They became the first professionals to have completed PADI's aquanaut instructors course at the Marine Resources Development Foundation's Classroom Under the Sea habitat in Key Largo, Florida. Both men lived five fathoms below the surface, for 48 hours, in comfortable accommodations, inside the only habitat now available to divers. There, they both completed a rigorous training course designed by PADI and instructed by Lance Rennka.

DIVER VIDEO MAGAZINE

Sea Fans, the first video magazine for divers, will be introduced this fall. It will be produced quarterly and sold by subscription only. Every three months subscribers will receive a cassette with 90 minutes of coverage of diving topics.

The magazine is hosted by diver Jimmy Ibbotson of the Nitty Gritty Dirt Band, directed by PADI instructor John Evans and produced with the latest in underwater video equipment. Each issue of Sea Fans will include stories showing the underwater and surface features of premier diving destinations around the world.



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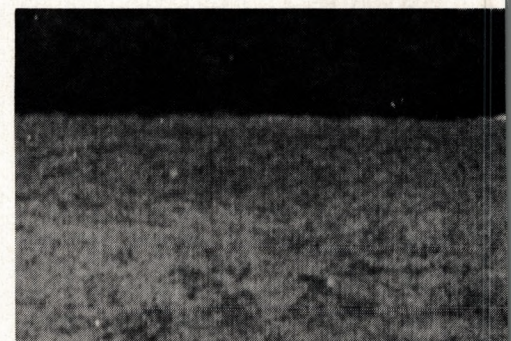
Lake Champlain's "CHAMP"

America's "Nessie"

BY ROD CANHAM

To many Northeast divers, Lake Champlain is known for its historical shipwrecks which predate the 18th century and link its waters to a bloody era in our country's early history. But to its local residents and cryptozoologists worldwide, Lake Champlain is known as America's Loch Ness. Here it is recognized as the home of "Champ," the Northeast's version of its Scottish counterpart, "Nessie."

While paleontology is the study of an-



cient animals and zoology the study of known existing species, cryptozoology attempts to study unidentified animals. They could be hidden, known animals previously thought to be extinct (i.e. the coelacanth, rediscovered in 1938) or a completely unknown species (i.e., the megamouth, a 15 foot, 1,653 pound shark netted in 1976 off Hawaii).

Throughout history, stories, legends and myths of sea serpents and monsters have been passed down and recorded. They have been the inspiration of religions, mythology and diverse art. Cultures worldwide have been touched by these treasures of lore, many having been based on known creatures such as whales, dolphins and manatees.

From Loch Ness, a small murky lake in the north central region of Scotland's highlands, over 4,000 sea monster sightings have been reported since 565 A.D. Even though much attention is currently being paid to Champlain's monster, its first recorded sighting dates back to July 1609. While gathering cartographical data and recording the indigenous flora and fauna, explorer Samuel de Champlain described seeing a serpen-

tine creature about 20 feet long, as thick through as a barrel with a head shaped like a horse. The Iroquois Indians, whose influence dominated the Champlain Valley up to the late 17th century, believed in a horned water serpent (paralleling reported modern sightings and a Loch Ness photograph of a serpentine creature with horn like appendages). Since then over 225 sightings have been reported on Champlain. Because research here is in its beginning stages, public input provides its primary data base. But eyewitness accounts come under critical attack by a skeptical public and are often discredited by scientists. Some of these sightings have been explained by known phenomena, others have not, but the credibility of the eyewitnesses should not be negated. These people have come from all walks of life and their accounts are too similar to be coincidental.

Champ's recognition has increased dramatically in recent years owing to the monumental efforts of Joseph Zarzynski and the Lake Champlain Phenomena Investigation (LCPI) team he founded in 1980. "Zarr," as he is known to his friends and associates, graduated (*cum*



photo/Sandra Mansi Courtesy Gamma-Liaison

laude) from Ithaca College in 1973. He received his master's degree in social science from SUNY, Binghamton in 1975 and is currently teaching 9th grade social studies at Saratoga Springs, New York. This vocation allows him time to pursue his quest for the hidden lake creatures during the summer months, including, to date, seven trips to Scotland's Loch Ness. Zarr's interest in Champ began in 1974. As a natural extension of his work, he completed his diver's certification in 1981, using his newfound skills in correlation with the LCPI's sonar work. A tall, slender marathoner and an avowed workaholic, he has written numerous articles, given lectures and appeared on several radio and TV programs. Yet he found time as director of LCPI and publisher of a newsletter to author a new book, *Champ—Beyond the Legend*, (Bannister Publications, Port Henry, NY, July 1984). This 224 page manual is a fascinating, well illustrated account of LCPI's work on Champ and correlated cryptozoological research on Nessie and other lake creatures. Zarr brings to the forefront up-to-date information in hopes of encouraging public awareness and to

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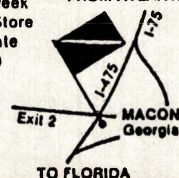
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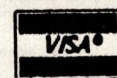
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CHAMP

spur the scientific community's involvement in helping unravel the mysteries. The book also lists the data received from sightings, including a record 26 in 1983.

LCPI's thrust is to undertake a complete, in-depth cryptozoological investigation into the Champ mystery, support legislation to protect these animals and encourage the public to report any new sightings. They are financed by private donations and subscription income from the quarterly newsletter Champ Channels. It contains articles, photographs, sketches of Champ, maps, new sightings and information on related research.

Currently, scuba monitoring, surface visual and photographic surveillance is being done. Sonar scanning has been conducted by Jim Kennard of Rochester Engineering Laboratories with the assistance of Scott Hill, both members of LCPI. This has been no small task as Lake Champlain is 109 miles long, 11 miles wide and 400 feet deep with 587 miles of shoreline and 440 square miles of surface area. The two other team members are M. Pat Meaney, a diver and librarian, whose assistance in research, indexing and proofreading has been invaluable, and Jack Sullivan, a certified NAUI instructor.

The most startling photographic evidence of Champ was taken by Sandra Mansi on July 5, 1977 while vacationing in the St. Albans vicinity with her fiancé and her two children. They were alarmed to see a snakelike head and neck rise six feet out of the water about 150 feet from where the children were wading. The creature was "like seeing a dinosaur." As it slowly moved in the vicinity for four to five minutes, her fiancé retrieved the children and handed her a Kodak 708 Instamatic camera from his pocket. Mansi had the where-with-all to take one picture then return to their car. Afraid of the public's reaction to the resultant print, the Mansi's hid the photograph for two years, eventually contacting Dr. Phil Reines at SUNY, Plattsburgh. The picture was channeled to the Kitt Peak National Observatory via Zarzynski at LCPI and the Smithsonian Institution. Densitometer studies and enhancements were done proving there was no doctoring of the photograph. It has since been published in the New York Times (6/30/81), Time Magazine (7/13/81) and Life magazine (8/82). Because of the lost negative and singularity of the original print, incontrovertible evidence still needs to be found to prove Champ's existence.

The push to legally protect Champ has proven successful. Zarr has co-authored legislation the assemblies of New York and Vermont have enacted, recognizing the entity of Champ, encouraging scientific research and protecting its right to remain unharmed. The State of Vermont's

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Underwater Life Support Systems are potentially dangerous to a non-trained user. These include scuba tanks, regulators and buoyancy compensators. This ad does not constitute an offer to sell these items via mail order.

Lottery Commission adopted Champ as one of its lottery game themes and a public forum "Does Champ Exist—a Scientific Seminar" was held in August of 1981.

So just what is Champ? Dubbed *Belua aquatica champlainiensis*, meaning "the large water animal of Champlain," cryptozoologists have been trying to solve the puzzle of these hidden lake creatures.

Utilizing all the circumstantial evidence available, the cryptozoologist attempts to put together an "identikit" to inform the public where, when and how to look for, attract, approach and possibly capture one. Considered the "kissing cousin" of Nessie in appearance, Champ's identikit is as follows: Behavior—shy, elusive, curious (at times), observed during calm, windless, clear days, primarily during the summer months (possibly owing to the fact salmon rise to the surface to feed on insect hatches); Size—26.25 feet average; Color—dark (black, gray, brown); Skin—no consensus; Head—snakelike, round, horse's, dinosaur, dog, stovepipe, periscope, with horn-like appendages; Habitat—the entire lake.

It is believed Champ may actually be a breeding colony of numerous animals thought to be extinct. They are also considered fish predators or carrion feeders, though no strong evidence supports either theory.

There have been many theories of just what Champ is. Of the three listed below, the most romantic is the Plesiosaur—an extinct marine reptile, which grew to 60 feet in length, with a long neck, small head, wide body, long tail and four fins. A snakelike whale called a *Zeuglodon* has a little more credibility, but the latest nominated candidate is a pinniped (the group of aquatic mammals such as seals and walruses) given the provisional name of *Megalotaria longicollis*.

Until these mysteries have been solved, Zarzynski's immediate concerns center around the protection of Champ. He recalls the 1976 account of a man who had a Champ sighting and didn't know whether to get a camera or a gun; Clifford Rollins' offer of \$500 cash for the hide of Champ, dead or alive and the scientific community's insistence upon a carcass before acceptance of its existence, "Sort of encourages people to go out and get one."

In the meantime, Zarr follows his own ethic of patience and persistence. "The search is like a giant puzzle. Little by little the puzzle is being put together."

Anyone interested in subscribing to Champ Channels should make out a check for \$8 to LCPI and send it to M-Z Information, P.O. Box 2129, Wilton, NY 12866. Copies of the book *Champ—Beyond the Legend* may be obtained from the same address. Checks should be made out to M-Z Information for \$8.95 soft cover or \$16.95 hardcover plus \$1.25 per copy for postage and handling. New York State residents add seven percent for sales tax.

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RANGER 70 PNEUMATIC SPEARGUN

Quiet Power

BY JIM WALKER

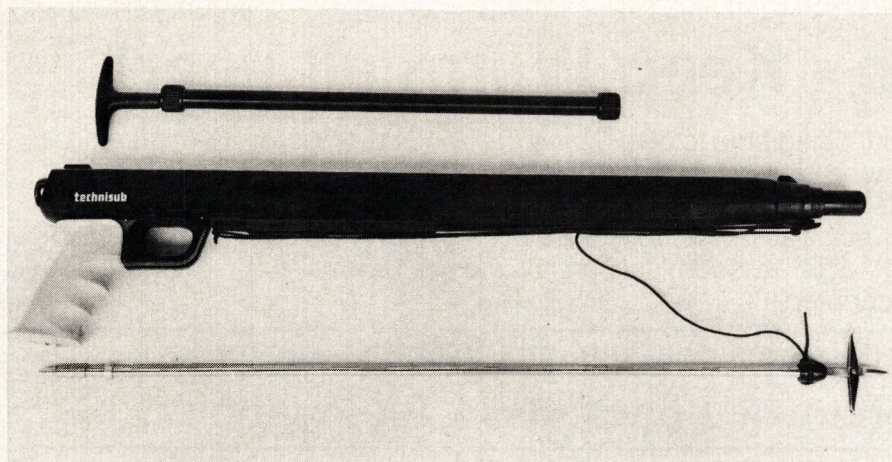
"No, I wasn't after game today," I fibbed to the fishermen loitering on the dock—glad the Ranger 70 pneumatic speargun was hidden in my gear bag. There was no point trying to explain to them that the dive sites our boat had visited hadn't offered any fish I felt worthy of bringing home. They would have just snickered to themselves and mumbled something about "divers." Besides, I didn't have to prove anything to anyone. I had gotten to the point I could blast a dime sized kelp bladder two out of three tries from five feet away. The Ranger 70 could have taken any of the fish I saw. I knew it and the fish knew it.

Just over 27 inches long, the Ranger 70 will fit in a large gear bag and yet it has the punch to take all but the biggest fish you're likely to encounter. It's well balanced, comfortable to grip, rugged, accurate and good looking. It also incorporates several handy design features that aren't obvious at first glance.

The exterior of the Ranger 70 is made of rugged, lightweight plastic, black to reduce glare and help you sneak up on your quarry. Except for the muzzle, the entire barrel area is covered with a slightly buoyant, high impact rubber that makes the gun light underwater and is relatively noiseless in collisions with rocks or coral. The gun handgrip is bright yellow plastic. Your hand covers this when hunting, but uncovered it is easy to see underwater or above and can be used to signal a buddy or can help you locate your gun if you should ever drop it. The grip is anatomically shaped to accommodate the fingers on your right or left hand.

The Ranger 70 fires a 24 inch steel shaft with a hinged, double barb point. The shaft is tethered by an eight foot long, braided nylon shock cord. This wraps around a clip in front of the trigger guard and is released automatically when the trigger is pulled. To keep the cord taut, I'd add a rubber stretch section to it.

The amount of pull required to operate the trigger can be adjusted by turning a screw on its underside. Thus, you can set the trigger sensitivity to your individual preference. However, it should never be



photo/Bonnie J. Cardone

The Ranger 70 is a pneumatic speargun. The pressure inside the gun's chamber can be increased through the use of the hand pump (at top). The gun fires a 24 inch steel shaft with a hinged, double barb point. A loading handle (not shown) is included.

set so light that a bump on the gun could fire the shaft.

The gun's safety is on the right side of the grip above the trigger guard. It can be operated by the forefinger of the gun hand (right handed divers). It is a lever-type device and swings through more than 90 degrees from the fire position to the safety position (make sure to move it all the way). The safety operates noiselessly and, by feel or at a glance, you can instantly tell if it is on.


As mentioned, the Ranger 70 is a

pneumatic gun. The air chamber comes pressurized to 18 atmospheres. I found this plenty of power. However, through a port on the butt of the gun, the chamber can be pressurized up to 25 atmospheres. A hand pump is provided for this purpose, with each 100 pump strokes equal to about seven atmospheres increased pressure. Excess pressure can be bled off by pressing in on a plastic button in the chamber port (point the port up and away from your eyes when doing this).

The gun is loaded by bracing the butt against your thigh and pressing the shaft into the gun, using the loading handle provided. And, while high chamber pressure translates to high shaft speed and striking power, this pressure can be difficult to overcome when loading the shaft. To avoid this the Ranger 70 features a small lever on the left side above the handgrip. With the lever in the down position (red dot visible), the shaft can be slipped into the gun while bypassing most of the chamber pressure. Then, flipping the lever all the way up (yellow dot visible) taps into the full chamber pressure for spearfishing.

Maintenance of the Ranger 70 includes thorough rinsing with fresh water after a diving day and occasional spraying of silicone lubricant into the small holes on the sides of the muzzle. After long periods of storage, work the shaft up and down in the gun to redistribute lubrication.

The Ranger 70 is made by Technisub of Italy and distributed in the U.S. through Aquacraft II. It is warranted to be free from defects owing to material or workmanship for one year. Aquacraft recommends the gun be returned to them for servicing once a year. When this is done after the first year the warranty is automatically extended for an additional year.

The suggested retail price of the Ranger 70 pneumatic speargun is \$169.95. Grip one at your Aquacraft dealer. I think you'll like the feel of it. 

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Sale price \$569.95

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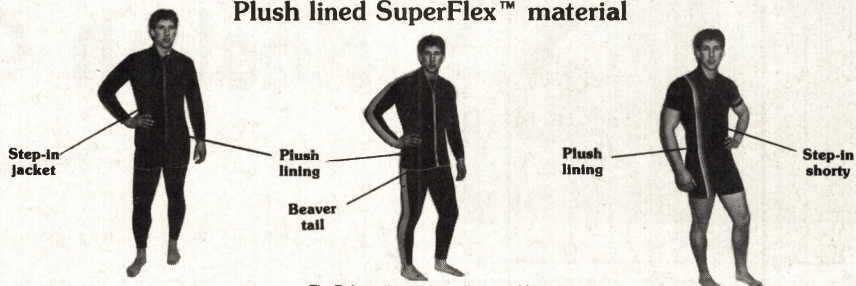
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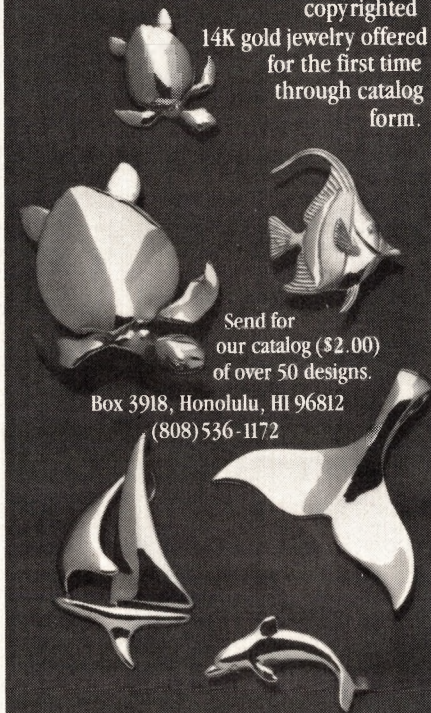
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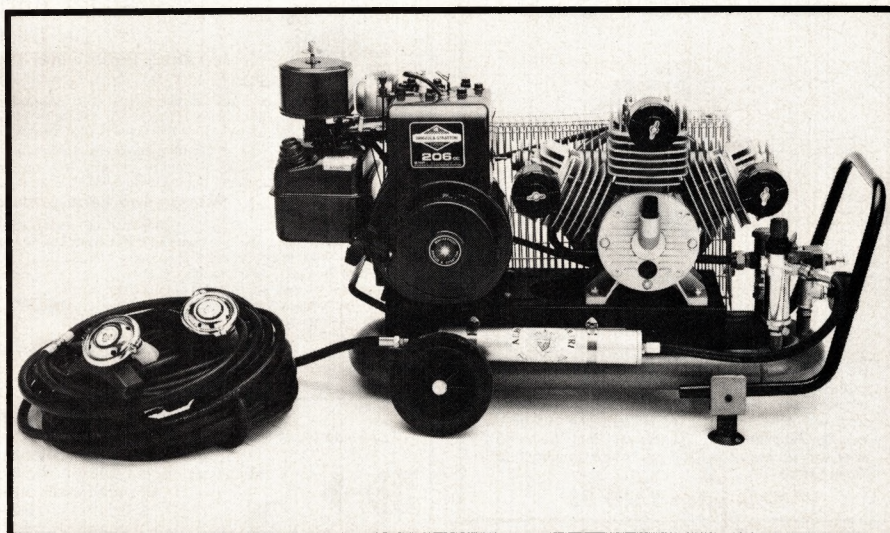
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The Coltri Eolo 300 Hookah Compressor

BY GEORGE COZENS

Known variously as Surface Air Supply (SAS), Surface Powered Air Compressing Equipment (SPACE) and tethered or umbilical diving, it is still simply called hookah by many of its practitioners. Obviously, there are some major differences between hookah and scuba diving. One of the most notable is that hookah divers are not limited to just the air they can carry on their backs. Without this restriction bottom times can be greatly increased. Extending the time underwater can be a distinct advantage in such sport and commercial diving applications as urchin collecting, treasure hunting, shelling, gold dredging, archaeology, photography, research, salvage and repair, and the cleaning of boat bottoms.

Whatever the diving application, a hookah compressor that will most likely meet the need is the Eolo 300, by Coltri-Sub. It is a husky little unit, measuring about three feet long, one and one-half feet wide and almost two feet high. It weighs about 91 pounds. The dolly-like frame and two, six inch diameter wheels allow the compressor to be rolled easily by one person. Handles at both ends facilitate lifting the unit by two people. Flotation is not standard equipment—the operator must supply the dock or boat.

The five horsepower, 206 cc 4 cycle Briggs and Stratton gasoline engine is standard, however. If desired, electrically powered models are optionally available. The compressor of the Eolo 300 consists of an aluminum body with three cast iron

cylinders, each with its own air intake filter. Compressed air is collected from the cylinders in a manifold, then passed through an air feed valve into the doughnut shaped holding tank. When pressure in this tank has reached a preset value, the air feed valve closes off the tank and discharges the air from the cylinders to the atmosphere. Should the pressure in the tank drop, the air feed valve will open, allowing compressed air to replenish the tank. All this time the Briggs and Stratton is still running.

Connected to the tank is an adjustable pressure control valve, which provides the first stage of air regulation and a pressure gauge, which monitors the low pressure air. Also attached to the holding tank is a pressure gauge for indicating tank pressure, a safety valve to relieve any overpressure and a petcock for draining condensate. Atop the pressure control valve/first stage are two manually controlled valves for directing the flow of low pressure air, through smallish quick-connect fittings, to an air tool hose, and/or through the activated charcoal filter cartridge and hence to the diver(s).

Standard equipment for the Eolo 300 is a 33½ foot long low pressure hose, with a single quick-connect fitting at one end for attaching to the charcoal filter cartridge. There are two quick-connect fittings at the other end for the attachment of one or two second stage hoses. The two second stage hoses supplied are about 19 feet in length and each is

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equipped with a conventional, downstream, demand valve, Aero Tecnica Coltri second stage regulator. Additional hoses and second stage regulators are optionally available.

According to the U.S. distributor, American Radhial, the Eolo 300 has an air flow capacity of 10.5 cfm, and can support up to six divers on shallow dives (to a maximum of about 30 feet) or a single diver using an air tool. The holding tank is reported to have a capacity of about 4.5 cubic feet when the air pressure is at its maximum value of about 200 psi. The running time of the engine, on a full tank of gas, is 60 to 90 minutes.

There should always be someone topside operating the compressor; watching the gas consumption, monitoring the pressure gauges and draining the condensate once every 30 minutes, as recommended by the manufacturer.

Recommended routine maintenance of the compressor is relatively simple. After the initial 10 hour break-in period, the intake air filters should be cleaned. The activated charcoal filter cartridge should be replaced after every 20 operating hours. After 100 hours the intake filters should be replaced and the oil should be changed every 250 hours.

Unfortunately, a tight schedule did not permit an in-water test of the Eolo 300 compressor. The best we could do were some topside operations—but these operations turned out to be interesting. With the engine set at mid-throttle and started, the compressor took less than 10 seconds to fill the holding tank to its preset pressure. This pressure, controlled by the air feed valve and preset at the factory, was only 110 psi; not the 200 psi previously mentioned. This lower air pressure, in effect, reduces the volume of air available at the time of engine shutdown to about one-half the amount discussed earlier. Rapid, deep breathing dropped the holding tank pressure to between 90 and 100 psi with the engine running. I couldn't outbreathe the unit. Without further inhalations the engine was stopped. The tank pressure read 110 psi. Then with eight to ten deep inhalations the tank pressure dropped to between 40 and 50 psi. A few more inhalations reduced the pressure quite rapidly, with the inhalation effort increasing remarkably at pressures below 30 psi.

Optionally available are several different harnesses—the one you select depends on what activity you intend to pursue—that attach the hookah hose to the diver. Also available as an accessory is an intake extension hose.

All in all the Eolo 300 hookah compressor by Coltri-Sub appears to be a fine unit. For a retail price of \$2,132, it might be just the system you need to improve your commercial diving efficiency and/or increase your sport diving fun in shallow waters. For more information contact American Radhial, Inc., 136 Charwood Circle, Rochester, New York 14609. x

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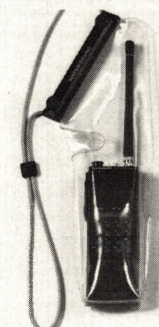


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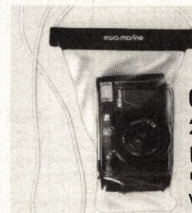
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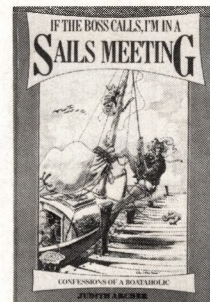
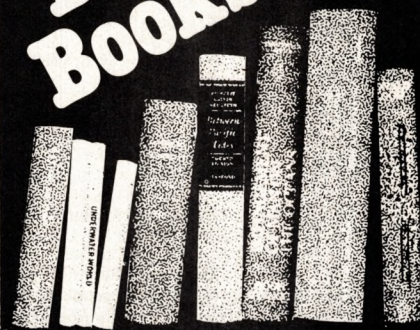
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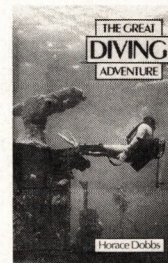
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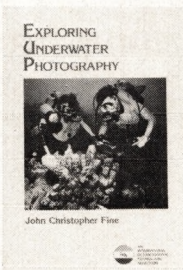
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The Great Diving Adventure—This book offers first hand accounts of Horace Dobbs' travels in the world's seas including cave exploration, finding treasure and an encounter with Arab pirates. \$12.95. Interbook, Inc., 14895 E. 14th St., Suite 370, San Leandro, CA 94577.



Exploring Underwater Photography—By John Christopher Fine, this book covers cameras and film, lenses and hardware, lighting and a variety of techniques. Black and white and color photos. \$16.95. Plexus Publishing, Inc., 143 Old Marlton Pike, Medford, NJ 08055.

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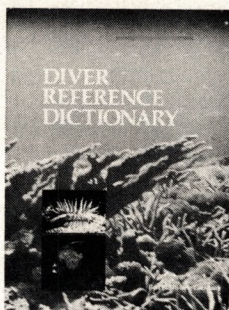
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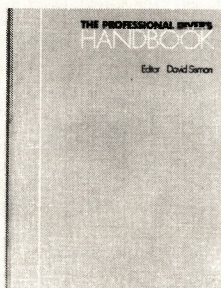
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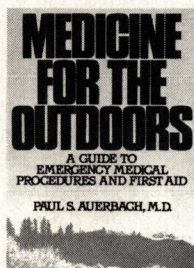
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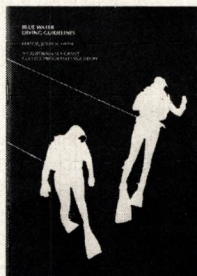
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The Professional Diver's Handbook—Edited by David Sisman, this is a thorough reference book for the commercial diver. Packed with illustrations, it covers subjects from U/W inspection and welding to rescues. \$48. Gulf Pub. Co., P.O. Box 2608, Houston, Texas 77001.



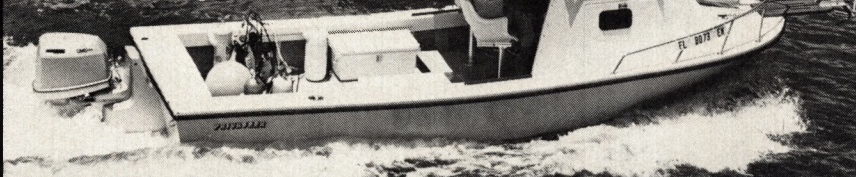
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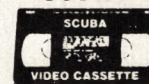
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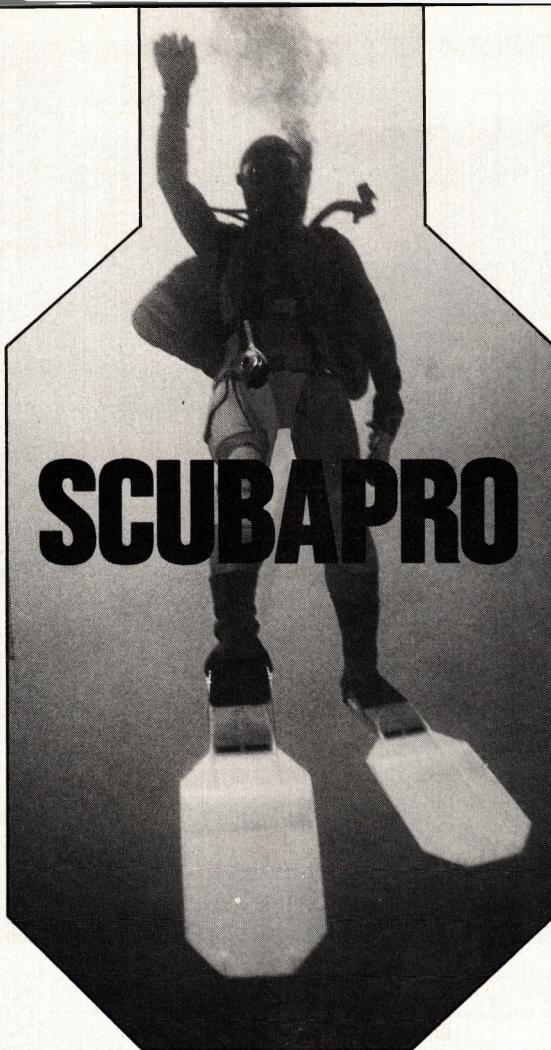
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SEA WING

Fin Of The Future

TEXT AND PHOTOGRAPHY
BY ERIC HANAUER

Scutapro has been slow to add a plastic fin to its product line. While other manufacturers were introducing theirs, Scubapro continued producing only rubber fins. When the company finally came out with a plastic fin, it had to be different in order to maintain its reputation for innovative design. The Sea Wing is different, not only in looks but also in engineering.

Scubapro contends that all fins, from the Churchills to the plastics, have been designed on the wrong principle. They work, but not in the way we think they do. That's because fins don't push water backward to move you forward. For most divers, that's like saying there is no Santa Claus. But the fact is that fins move us by lift, not drag. The Sea Wing is the first fin designed from the

outset to utilize lift force for propulsion.

To understand this, we need to review some hydrodynamic theory. For the past 15 years, swimming coaches have realized that human beings move through the water most efficiently by utilizing lift rather than drag force. A swimmer's hand moving through the water acts as an

airfoil, or a wing, rather than a paddle. Water pressure on the back of the hand is less than that on the palm, thereby lifting the swimmer forward. In this respect, the hand works the same way as an airplane wing or a ship's propeller. Both utilize negative pressure to achieve lift. The key to maintaining that negative pressure is a proper angle of attack, changing the pitch of the hand throughout the stroke to reduce turbulence.

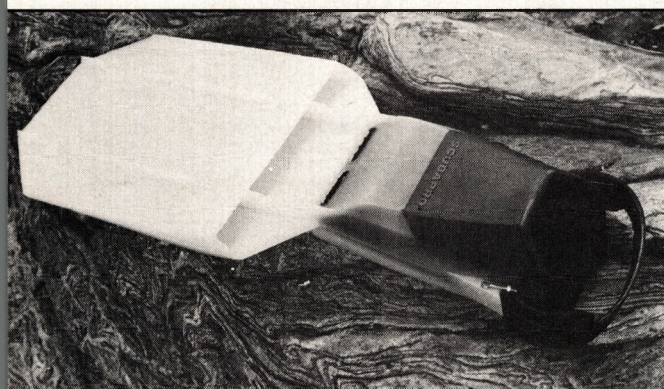
The kick produces propulsion in the same manner as the arms. Water is pushed backward for only a small segment of the stroke; during most of the action the fin moves through the water at various angles. All fins, even those designed to utilize drag force, are actually moving the diver by lift.

Scubapro engineer Mark Lamont was assigned the task of designing a better fin, one which would maximize lift force. He began by reviewing hydrodynamic theory and ended up with something that shares little but a foot pocket with contemporary fins. Beauty is in the eye of the beholder and the Sea Wing gets mixed reviews on aesthetics.

But if form truly follows function, then the Sea Wing is a thing of beauty, because it really works.

But just how does the Sea Wing work? On conventional fins, the ribs running from the foot pocket along the sides of the blade cause turbulence and disrupt water flow. The Sea Wing's leading edges allow the blade unrestricted access to undisturbed oncoming water. The blade itself is shaped like an airfoil, with an upturn leading to the vents. This is the most efficient shape for producing lift force. The notches in the center ribs allow the blade to bend a controlled amount, while easing strain on the ankle. This allows a very stiff blade, without the discomfort that usually accompanies it. The small tabs on the end of the blade act as stabilizing vanes which, with the ribs, prevent torque while kicking.


This fin reinforces good kicking mechanics. Instructors teach us to begin kicking with a bent knee and then to follow through, finishing with a straight leg, as if we were kicking a football. Sometimes that isn't easy to accomplish, especially with large-bladed, stiff fins. We often revert to a slight bicycle kicking action. The Sea Wing rewards proper mechanics with strong propulsion. I found it easy to follow through on the kick. This was especially evident when kicking on my back, on the surface. With my old fins, it was hard to keep my knees underwater. With the Sea Wing, it was easy and I seemed to move better with less



The Sea Wing's radical new shape is designed to take advantage of lift force, translating it into forward propulsion. The stiff plastic blade has notches (near the vent) that allow it to bend a controlled amount to ease ankle strain. The ribs and small tabs prevent torque during kicking.

effort. A big, slow kick was the most effective for me. Mark Lamont felt better using a shorter, quicker leg action. Each diver should experiment to determine what works best for him/her.

Sea Wings weren't designed to float, but they do. That's fine if you lose one in the surf, but not so good if you're spearfishing on a snorkel and want to avoid splash. Many spearfishermen use ankle weights with their Sea Wings to keep the kick underwater.

At press time, only a large size fin was available. It runs a bit narrow, so divers with wide feet may find it uncomfortable. But, by the time you read this, a larger and a smaller size should also be available at your Scubapro dealer, for \$52. The Sea Wing may look a bit strange today, but it could be our first glimpse of the fin of the future. 


FLORIDA DIVE FLAGS

A new bill enacted by the Florida State Legislature and recently signed into law prohibits divers from displaying dive flags in such a way that they create a hazard to navigation. The bill, HB 441, was introduced by State Representative Dennis Jones, (R), of Seminole, Florida. It states:

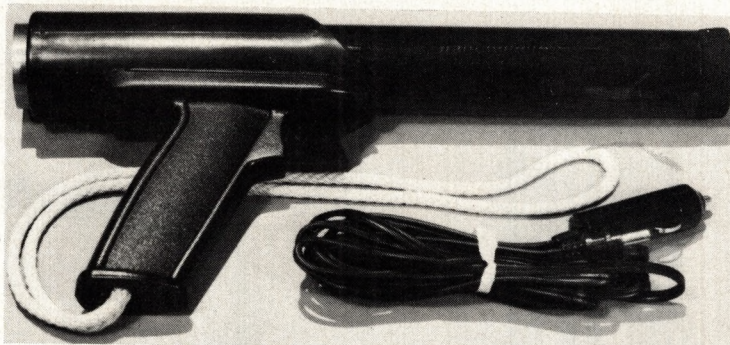
"No diver or group of divers shall display one or more divers down flags, on a river, inlet or navigation channel, except in case of emergency, in a manner which shall unreasonably constitute a navigational hazard. Divers shall make reasonable efforts to stay within 100 feet of the divers down flag, on rivers, inlets or navigation channels.

"Any willful violation of this section shall be a misdemeanor of the second degree punishable as provided by s. 775.082 or s. 775.083."

Upon the bill's introduction, several members of the diving community expressed concern that it would allow overzealous law enforcement officials and prosecutors to cite or prosecute divers whose flags, although in navigable waters, didn't pose a hazard to navigation.

Former State Speaker of the House Ralph Haben, acting on behalf of PADI, met with Representative Jones to discuss divers' concerns. According to Bob Harris of Haben's law firm, "We were able to suggest alternative wording that stated that dive flag placement must *unreasonably* constitute a hazard to navigation to be considered a misdemeanor. This wording also established that prosecutors would have to prove that divers *willfully* created a navigational hazard to obtain a conviction. Representative Jones was happy to incorporate this revised wording into the final version of the bill." 

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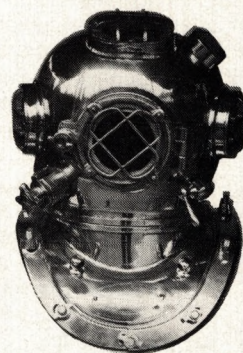
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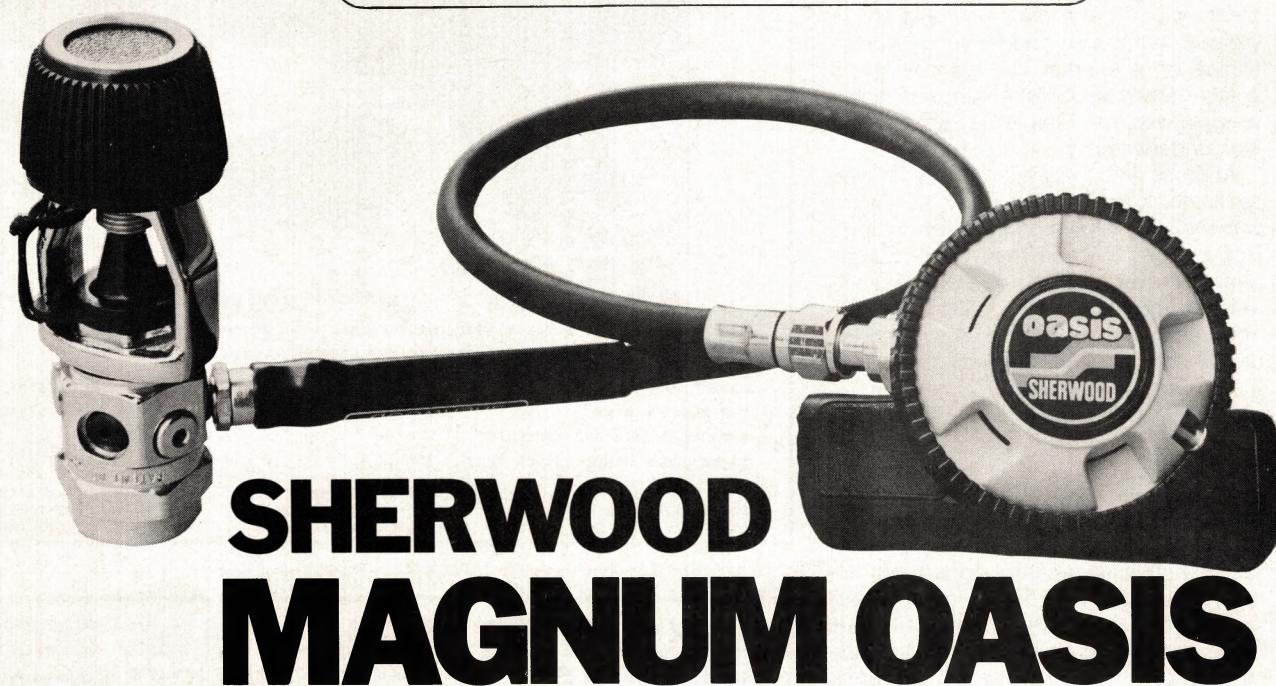
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SDM SPECIAL SERIES ON REGULATORS



SHERWOOD MAGNUM OASIS

TEXT AND PHOTOGRAPHY BY ERIC HANAUER

Some like it wet, some like it dry. We are talking about the air you breathe from your regulator. With Sherwood's new Magnum II and Magnum Oasis, you can have it either way.

Most of us prefer dry, especially when it comes to saltwater leakage. The secret to a dry breathing regulator is effective sealing of the exhaust valve and many models in use today breathe as dry as July in the Sahara. The result is often that parched feeling in the mouth and throat called cotton mouth. Various add-on devices have been developed over the years to act as moisturizers to combat the problem. But those added more pressure fittings to the system and sometimes became a source of air leaks and added maintenance problems.

The engineers at Sherwood have come up with a simple, ingenious solution to cotton mouth and incorporated it into the new version of their top-of-the-line regulator. A pair of thin aluminum vanes, attached to the demand valve body, curve upward into the mouthpiece chamber. Droplets of moisture from your exhaled air condense on the vanes, then as you inhale, the incoming air is moistened as it flows up across them. The result is like a gentle rain on a parched desert. It's

called the Magnum Oasis and it costs only \$10 more than the Magnum II.

The Oasis is Sherwood's flagship regulator, Magnum II, with moisturizing vanes added. It now features first stage porting increased by 70 percent and a new, high capacity second stage hose for better airflow. The result is a significant increase in airflow at depth, and at low tank pressures, over the original Magnum.

Instead of increasing the diameter of the entire hose, Sherwood engineers enlarged the size of the opening in the fitting. This way, the benefits of greater unrestricted airflow are realized while hose fittings remain the standard 3/8 inch. They are compatible with older Sherwoods as well as regulators from other manufacturers. For added strength, all hose fittings are now stainless steel instead of chromed brass.

First introduced in 1979 under the name Magnum Blizzard, this regulator was designed for diving under the ice and in severe conditions. The first stage has a unique bleed valve system, which keeps water and contaminants out. If you didn't know better, you'd think something was wrong with the regulator, because a constant stream of tiny bubbles seeps from the first stage. This is Sherwood's

way of providing environmental protection for the balanced piston mechanism.

The major disadvantage of a balanced piston first stage is that the interior is exposed to water and all the silt, salt and crud suspended in it. Eventually, this takes its toll on delicate O-rings and valve seats. In cold water, air rushing through the mechanism can cause icing and freeze-up, even at temperatures above freezing. Some manufacturers offer environmental kits, consisting of a silicone filled chamber, to protect the piston and spring mechanism. Ambient pressure is transmitted to the piston via the silicone grease. Sherwood's solution is to keep the water out entirely by maintaining a pressure of one to two psi over ambient within the spring cavity. There is a small opening in the main piston that allows intermediate pressure air to bleed into the ambient pressure chamber. When it builds up to one or two pounds over ambient, the air is released through a rubber bleed valve. This valve looks like a rubber plug, set between the high pressure port and an adjacent low pressure port. A tag packed with the Oasis informs the customer that the bubbling is a normal part of the regulator's operation, so don't mess with the bleed valve. Sherwood en-



The Oasis incorporates a pair of aluminum vanes inside the second stage that curve upward into the mouthpiece chamber (above left). Droplets of moisture from exhaled air condense on the vanes and, on inhalation, moisten incoming air. Contaminants are kept out of the first stage (above right) by maintaining an air pressure inside the stage that is slightly above ambient. The air is released through a rubber bleed valve.


When a regulator is stored, the purge button should be depressed to prevent the downstream valve's sealing surface from taking a "set." Some manufacturers supply plastic keys to keep the button down, but these are usually misplaced or forgotten. Sherwood has a small nickel plated brass plunger, built into the second stage cover, which keeps the button depressed. If you forget to release it, the sound of hissing air when you turn the tank on will quickly remind you.

The exhaust tee and the mouthpiece are both made of the same polyvinyl chloride plastic. It works well in the exhaust tee, but the mouthpiece felt too large, stiff and uncomfortable. According to Sherwood's John Canna, it is imminently due to be replaced by one made from a softer compound.

The first impression on our test dive of the Oasis was a slight whistling noise on inhalation in shallow water. It is probably some sort of resonance originating in the moisture condensation vanes. The noise disappeared at depths of more than 30 feet, but returned when we ascended. Other than that idiosyncrasy, the Oasis proved to be a good performer. The vanes seemed to do their job, because there was no cotton mouth feeling. My reference regulator also breathes a bit moist, so the contrast was not overwhelming. But Canna explained that the Magnum II is an extremely dry breather and the Oasis was developed to meet the needs of divers who are bothered by this.

The Oasis is an easy breathing regulator with low cracking effort, even at depth when swimming hard to simulate a heavy work load. There were no leaks of water or air in any of my normal diving positions: prone, vertical, looking up or even on my back. The only time the regulator freeflowed while in my mouth was during a head down descent and that was slight. When the Oasis is removed from the mouth, it freeflows strongly, but this stops when the mouthpiece is turned down.

Exhalation is easy, as is purging (either by blowing or by using the button). At low tank pressures, the balanced piston first stage continued to supply air with no perceptible restriction. Generally, the Oasis was a smooth performer.

Sherwood offers three versions of the Magnum: the II for those who like it dry, the Oasis for those who like it moist and the Blizzard for those who like it cold (as in under the ice). All come with a lifetime warranty that includes parts, as long as authorized annual maintenance is performed. The range in retail prices is only \$15 from top to bottom, so needs, not economics, can dictate your choice. The Oasis is in the middle of the pack, at \$239.95. 

gineers claim the air lost by this device is insignificant and George Garrison of National Scuba, Huntington Beach, CA, agrees. "Over the course of a dive, it would be about five breaths," he states.

The second stage of the Oasis is Lexan® plastic, available in yellow, black, blue or orange. Access to the inside, for removal of sand particles or other foreign matter, is easy. A small spring retaining clip is removed with a screwdriver or pen knife. Then the cover can be unscrewed by gripping the splined, black circumference ring. Not only does the ring have a better grip than the old one, it also looks good. Normally, there is nothing inside the case a diver should disturb.

The downstream valve assembly is quite conventional except for the lever/diaphragm contact. The second stage lever ends in a roller, which rests against the metal disk on the back of the diaphragm. Friction is reduced significantly by the roller's action. In most regulators, the lever slides against the disk; in the Magnum and the Oasis, it rolls. Less friction contributes to lower cracking effort.

MAGNUM OASIS

First stage:

TypeBalanced piston
Maximum pressure3,500 pounds
Materials.....Chrome plated brass body
Teflon seat
High pressure ports.....One, 7/16" diam.
Low pressure ports.....Four, 3/8" diam.
Environmental protection.....Standard
Overpressure device

Hose length.....31 inches

Second stage:

TypeDownstream, lever action
Materials.....Case and cover:
Lexan® plastic
Diaphragm and exhaust valve: Silicone
Mouthpiece and exhaust tee: PVC
Colors.....Yellow, blue, black, orange
Features.....Moisturizing vanes
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A KEY LARGO CONDO Moon Bay deluxe 2 BR, 1½ bath w/dock, sleeps 6. Near Pennekamp, dive centers, marinas and Largo cut. Scuba, snorkel, fishing, skiing, tennis. \$395 per wk. Reserve early.	Call collect 813/939-3612
AMERICAN DIVING HEADQUARTERS, INC. Rt. #1, P.O. Box 274-B, Key Largo, FL 33037 SSI, PADI, NAUI. Pennekamp our specialty for 23 years. 2-7 day packages, ½ & all day trips. For res. call toll free 800/634-8464.	305/451-0037
AQUATIC FLOATING SEA COVE MOTEL 12685 Overseas Hwy., Marathon, FL 33050 Budget Rates. Summer \$19-\$39. Winter \$24-\$44 for two. Private deep harbor & ramp on Atlantic. A#1 rooms and effs.	305/289-0800
BAY HARBOR LODGE Rt. 1, P.O. Box 35, Key Largo, FL 33037 MM 97.5 Best rates. Motel, efficiency apartments. Beach, dock.	305/852-5695
BIG PINE SEA CENTER DIVE SHOP P.O. Box 515, MM 29.5 US #1, Big Pine Key, FL 33043 Dive Looe Key, #1 Reef in FL. Keys, full service shop. Dive/lodging packages, custom boats.	305/872-2319
BUDDY'S DIVE SHOP P.O. Box 409, Islamorada, FL 33036 MM 79.5 Bud 'n Mary's Marina Dv. aboard our 40' 'Scuba Safari' & 34' 'Free 'N Clear'. Full ½ day trips to Alligator Reef, Cannabis Cruiser & Coral Gardens. Pkgs. avail.	305/664-4707
CAPTAIN CHAMBERS CHARTERS P.O. Box 2258, Key Largo, FL 33037 MM 100 31' cust. boat w/sundeck, 6 max. Free guided dv., U/W camera, brunch served, dv. pkgs. avail. Rec. by Undercurrents 3/82.	305/451-1805
CAPT. CORKY'S DIVERS' WORLD of Key Largo, Inc. P.O. Box 1663, Key Largo, FL 33037 MM 99.5 U.S. 1 past Wendy's Bahamas/Pennekamp, U/W video rental, snkl. w/dolphins, PADI instr., grp. rates, dive, snkl., sail, shell collect, spearfish. Best pkg. rates!	305/451-3200

CAPT. GREG'S SCUBA-DO P.O. Box 2237, Key Largo, FL 33037 MM 100 @ 100 Marina Dive Pennekamp, 34' Boat, 6 max. No crowds. Personal Service. Combin. Dive & Fish Trips Avail. Pkg. Rates.	305/451-3446
CAPT. SLATE'S ATLANTIS DIVE CENTER 51 Garden Cove Dr., Key Largo, FL 33037 MM 106.5 Dive Pennekamp on 1 of 4 cust. boats. NAUI, YMCA, PADI, CMAS. Instr., air & rentals, grp. & multi-dive disc. pkgs., gifts.	800/331-DIVE 305/451-1325
CORAL LAGOON RESORT AT THE DIVING SITE Middle Keys, MM 53, 12399 Overseas Hwy., Marathon, FL 33050 Waterfront efficiency cottages, dockage, pool, tennis, bikes. PADI dive shop, lessons, 3 boats, groups, spring/fall dive pkgs.	305/289-0121
DIVE KEY WEST "Carol J", P.O. Box 2842, Key West, FL 33045 Disc. room pkg. & grp. rates. Max. 6 divers. Lobster diving & spearfishing, rentals & air.	305/296-3661
FLORIDA KEYS DIVE & SKI, INC. P.O. Box 391, Tavernier, FL 33070 A PADI scuba train. fac. Checkouts, 4 day cert. course & all levels of instr. Spearfishing, shelling, watersports.	305/852-4599 6 pass. dive boats.
GILBERT'S MOTEL & MARINA 107900 Overseas Hwy., Key Largo, FL 33037 3/day dive pkgs. avail.; boat/jet ski/windsurf mntls.; wet/dry storage; fishing guides; bait/tackle shops; restaurant/pool.	305/451-1133
GOLDEN KEY MOTEL U.S. Rt. 1, P.O. Box 710, Islamorada, FL 33036 MM 81 Free dockage & boat ramp, waterfront cottage, rooms with stove & refrigerator, picnic & barbeque area.	305/664-4418
HALL'S DIVING CENTER & RESORT 1688 Overseas Hwy., Marathon, Fla. Keys 33050(in FL) Beautiful reef & wreck diving trips-Largest store & instruction. facility in the Keys—motel/condo diving packages arranged.	800/331-4255 305/743-5929
HAWK'S CAY RESORT & MARINA MM 61, Marathon, FL 33050 Tennis, pools, jacuzzis, reef trips, PADI. Custom-built dive boats, air/equip. rental, instr., pkg. rates.	US 800/327-7775 FL 800/432-2242
HOLIDAY ISLE DIVE CENTER P.O. Box 482, Islamorada, FL 33036 MM 84.5 All new "Wreck Diving" All new 22 passenger dive boat.	305/664-4145 FL 800/432-2875 US 800/327-7070
ISLAMORADA LUXURY CONDO The Hamilton Drydock Co., Box 51424, Indianapolis, IN 46251 Beautiful oceanfront top floor privacy, all amenities. Adjacent to Buddy's Dive Shop, Bud 'n Mary's Marina.	317/776-0444
KEY LARGO—From Studio apt. to 3 bedroom 2½ bath apt. Tennis, pool, dockage. Close to all dive shops & boat rentals from \$200 per week. Call 312/357-6285 or 305/451-4603.	
KEY LARGO CONDO 3 BR., 1½ Bath, completely furnished. Marina, saunas, tennis, pools, 2 mi. to Pennekamp Park. Great diving, fishing, sailing. Special summer rates.	305/433-8073 305/546-2275
KEY LARGO BAYFRONT HOME—Dive/Snorkel/Sail P.O. Box 161414, Miami, FL 33116 3 bedroom/2 bath gorgeous, new, private home with dock. Luxuriously furnished, fantastic rates—less than motel room.	305/255-4556
KEY LARGO LUXURY CONDO Oleinik, 8555 Blue Cut Lane, Cincinnati, OH 45243 Luxuriously decorated, 2 bedroom, dock, pool, sauna, tennis. Minutes from best dive areas.	513/984-0866
KEY WEST DIVER INC.—CAPT. BILLY DEANS c/o Reef Raiders Dive Shop, U.S. #1, Stock Isle, Key West, FL 33040. Dive the Sambos, Ten Fathom Ledge, WWII wrecks, USS Wilkes-Barre. Every dive an adventure.	305/294-0660
LADY CYANA DIVERS P.O. Box 1157, Islamorada, FL 33036 MM 85.9 26', 40' & 60' dive boats. Reefs, galleons, wrecks & The 'Eagle'. Complete pro shop, instruction, packages, photo center.	305/664-8717 800/221-8717
LOOKOUT LODGE RESORT Waterfront efficiencies, beach, boat ramp, docking. Dive packages. PADI OW/AOW. Rental tanks & Weight belts. MM 88 between Pennekamp and Islamorada.	301/474-6381
PENNEKAMP PARK CONCESSION P.O. Box 13PM, MM 102.5, Key Largo, FL 33037 The only dive shop located directly in Pennekamp. Free brochure, send 50¢ for reef chart.	305/451-1621
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ROCK REEF RESORT P.O. Box 73, Key Largo, FL 33037 MM 98 Divers Paradise, spacious grounds, beach, jacuzzi, comfortable accommodations and comfortable prices.	305/852-2401
SEA DWELLERS SPORTS CENTER 99850 Overseas Hwy., Key Largo, FL 33037 Reef trips daily to Pennekamp Underwater State Park. Dive package with Key Largo Holiday Inn.	305/451-3640 800/451-3640

SEAFARER RESORT MOTEL P.O. Box 185, Key Largo, FL 33037 MM 97.8 (Gulfside) "Fantasy Island" setting. Real, sandy beach & free paddleboat. Spotless rooms, effs. & apts. at best dollar value plus group rates!	305/852-5349
SEA HORSE MOTEL 7196 Overseas Highway, Marathon, FL 33051 Budget or waterfront rooms or efficiencies, 300' dockage ramp, pool, dive pkgs. Experience the American Caribbean.	305/743-6571
SEA TRAIL MOTEL Rt. 5, P.O. Box 91, Key Largo, FL 33037 MM 98.5 Cable TV, air-conditioned, refrigerator, budget rates.	305/852-8001
STEPHEN FRANK PHOTOGRAPHIC, INC. P.O. Box 2720, Key Largo, FL 33037 MM 102.5 Photo Tours, Instruction, Processing, Camera Rentals, Stock Photos.	305/451-3737
THE BOAT, a div. of Triangle Watersports, Inc. Rt. 2, P.O. Box 617, Summerland, FL 33042 Free color brochure, customized dives, adventure experiences, instruction, U/W video, Looe Key, Hawks Channel & Gulf.	305/745-BOAT
THE DIVING SITE, INC. 12399 Overseas Hwy., Marathon, FL 33050 MM 53.5 16 & 30 pass. dive boats. Daily reef trips. Charters & group rates, PADI lessons, sales, repairs, dive pkgs.	US 800/634-3935; FL 800/821-9155 305/289-1021
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DIVERS SUPPLY 5208 Mercer Univ. Dr., Macon, GA 31210 PADI training facility, all major brands. Located at exit 2 on I-475.	912/474-6790
DIVING WORLD USA 2945 Buford Hwy., Atlanta, GA 30329 All brands, wholesale, retail, repair, rental, trips. YMCA, NAUI, PADI classes. 3 man chamber.	404/634-4354

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AARON'S DIVE SHOP 602 Kaihua Rd., Kailua, Oahu, HI 96734 Dive w/the best in HI. Daily dives, 4 day cert. Referrals. Rntls. complete w/cameras & scooters since '71. Write for info.	808/262-2333 808/261-1211
ALOHA DIVE SHOP—KOKO MARINA Koko Marina Shpg. Ctr., Honolulu, HI 96825 "Diving is fun" with Jackie and her friends. Scuba resort cert., boats, tours, sales, rental, all cert.	808/395-5922 808/395-8882
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AQUATICS KAUAI 733 Kuhio Hwy., Kapaa, HI 96746 Full service, PADI, NAUI, SSI, U/W video taping & photo. Custom packages & tours aboard our 38' Wilson.	808/822-9213
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DIVE KAUAI 976 Kuhio Hwy., Kapaa, Kauai, HI 96746 Kauai's largest sport & commer'l facil., disc. prices, sales, rntls., free air, PADI/NAUI cert., sml. pers. chtrs., indiv./grp. pkgs.	808/822-0452
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FATHOM FIVE DIVERS P.O. Box 907, Koloa, Kauai, HI 96756 Specializing in small personal charters, daily trips. NAUI and PADI instruction, air, rentals, photography.	808/742-6991
HAWAIIAN WATERCOLORS P.O. Box 616, Kihei, Maui, HI 96753 Experts in dive charters, U/W video, U/W photography. Contact Ed Robinson for information.	808/879-3584
KONA COAST DIVERS 75-5614 Palani Rd., Kailua-Kona, HI 96740 Hawaii's only Full On Service Facility. RATED #1 by the LOCALS, "Just ask anyone."	808/329-8802 800/KOA-DIVE (for boat resv. only)

LAHAINA DIVER'S INC.		800/367-8047 ext. 102
710 Front St., Lahaina, Maui, HI 96761		808/667-7496
Daily trips aboard 2 fastest, most comfortable boats in Hawaii. Most personable staff. Maui's only PADI 5 Star.		
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Full service dive center, NAUI, PADI. Daily charters to shipwrecks, lavatubes, ledge dive and over 50 different dive locations.		
LET'S GO SHORE DIVE'N		808/322-6490
78-6842 Alii Drive #8-102, Kailua-Kona, Hawaii 96740		
Twice the fun, half the price! Economical dives mean more dives. Come as friends, leave as family!		
MAUI DIVE SHOP		808/879-3388
P.O. Box 1018, Azeka Place, Kihei, Maui, HI 96753		
Send for free Maui Diver's Guide, enclose \$1 postage. Dive charters to Molokini, rentals, 5 day scuba classes, windsurfing.		
OCEAN ACTIVITIES CENTER		808/879-4485
3750 Wailea Alanui, D-2, Wailea, HI 96753		
Hawaii's only dive lodge: Hotel Lanai. Daily dives to Molokini, La Perouse, Kahoolawe, Lanai.		
SANDWICH ISLE DIVERS		808/329-9188
73-1263 Lihau St., Kailua-Kona, HI 96740		
Daily boat charters, max. 6 divers, night dives, PADI classes. Packages available. Undercurrents choice. Call or write.		
SEA DREAMS HAWAII		800/329-8744
P.O. Box 4886, Kailua-Kona, HI 96745		800/322-6118
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4-1378 Kuhio Hwy., Kapaa, Kauai, HI 96746		
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SOUTH SEAS AQUATICS		808/538-3854
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Dive the Mahi, 165' shipwreck and lava tubes! Daily boat charters. Full service pro dive store since 1961. Write for free brochure.		
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Daily Dive & Snorkel trips to Molokini Crater, 4-5 day Scuba Classes, Windsurfing, Sailing, rentals, full service.		
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Waikiki's only pro dive shop. PADI & NAUI facility. Boat & beach dives, 3 day cert., charters, free brochure.		

ILLINOIS

THE GEAR BAG, INC.	312/637-FINS
1605 N. Newland, Chicago, IL 60635	
Located at 6900 west on North Avenue. NAUI pro facility & PADI training facility.	

INDIANA

SCUBA LAKE MICHIGAN CHARTERS	219/287-2223
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Dive aboard Sea Quest II. Club/shop rates, rentals. Special Mon.-Fri., 5-tank charters, discount program.	

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GETAWAY TOURS/GETAWAY TRAVEL INC.	504/475-7013
P.O. Box 776, Golden Meadow, LA 70357	504/475-7010
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5400 Crowder Bl., Unit E, New Orleans, LA 70127	
PADI 5 Star instructor development center, quality instruction, equipment, service and dive travel.	

MAINE

AQUA CITY SCUBA, INC.	207/873-0266
11 Water St., Waterville, ME 04901	
Sales, in-shop repair service, rentals, NAUI & PADI training facility. Central Maine's largest dive shop.	
TOMMY'S DIVE SHOP	207/772-5357
273 Congress St., Portland, ME 04101	
North East's largest, known coast to coast, disc. of 25-50% off everyday. Wreck charters, cut this ad out for free airlift.	

MARYLAND

DIVERS DEN, INC.	301/668-6866
8105 Harford Rd., Baltimore, MD 21234	
Maryland's oldest professional dive shop. Large enough to serve you—Small enough to know you.	
PARKS DIVING SUPPLY	301/655-8744
8027 Liberty Road, Baltimore, Maryland 21207	
Wholesale and Retail Sport and Commercial Diving Equipment.	
TIDEWATER AQUATICS	301/268-1992
1315 Forest Dr., Annapolis, MD 21403	
Full service pro dive store & skin diving school. Authorized Scubapro dealer & warranty service center.	

MASSACHUSETTS

AQUARIUS DIVING CENTER, INC.	617/759-DIVE
3239 Cranberry Hwy., Buzzards Bay, MA 02532	
Authorized Scubapro dealer. PADI instruction. Air, sales, full service, rental, dive travel.	
CAPE COD DIVERS, INC.	617/432-9035
815 Main St., Harwich Port, MA 02646	MA 800/DIVING-1
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122 Plymouth Ave., Fall River, MA 02721	
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LOWELL SCUBA CENTER	617/453-7574
477 Gorham St., Lowell, MA 01852	
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NORTHEAST SCUBA	617/777-DIVE
125 Liberty St., Danvers, MA 01923	
Scuba instruction, sales, air station, photo courses. Hydro test, regulator repairs, rentals, boat charters. Int'l Dive Travel.	

MICHIGAN

DIVER'S DEN	313/693-9801
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Sales, service, rentals, air, instruction. Great Lake Charter Specialists.	
SCUBA NORTH, INC.	616/947-2520
13258 W. Bayshore Dr., Traverse City, MI 49684	
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MINNESOTA

THE SUPERIOR DIVER, INC.	218/728-5877 or 218/475-2550
P.O. Box 388, Grand Portage, MN 55605	Ron & Jackie Polomski
Lake Superior shipwreck diving charters in Isle Royale National Park aboard the 'Superior Diver' & 'Royale Diver'.	

MISSOURI

WEST END DIVING CENTERS, INC.	314/731-5003
11215 Natural Bridge Rd., Bridgeton, MO 63044	314-822-3005
11004 Manchester Rd., St. Louis, MO 63122	314/358-5000
39 N. Allen, Bonne Terre, MO 63628	
WEST END DIVING'S-BILLION GALLON LAKE RESORT	
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Fully illuminated underground lake, 1 hour from St. Louis. 70 ft. visibility, 58° water temp.	reservations 314/731-5003

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492 Pompton Ave., Rd. 23, Cedar Grove, NJ 07009	
National certified instruction, private or group lessons. Indoor heated pool, full service dive shop.	
DOSIL'S SPORTS CENTER	201/787-0508
261 Rt. 36, E. Keansburg, NJ 07734	
Central New Jersey's largest dive store! Dive travel, rentals, 3,000 psi air, discount prices.	
EAST COAST DIVING SERVICE	201/591-9374
Spring Valley & Texas Rds., Morganville, NJ 07751	
NJ's 1st PADI 5 Star training facility. Sales, repairs, air, rentals, trips, photo. Rts. 9 & 18.	
MARLIN SCUBA SHOP	201/327-6000
506 Rt. 17, Ramsey, NJ 07446	
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PRINCETON AQUA SPORTS	609/924-4240
306 Alexander St., Princeton, NJ 08540	
PADI training facility. Full service dive, snow ski & windsurfing facilities. Diving vacations our specialty.	

UNDERWATER DISCOVERY, INC.	201/270-9100
2716 Rt. 37 East, Toms River, NJ 08753	
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Rt. 17 S., Rochelle Park, NJ 07662	
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WHITEHOUSE AQUATIC CENTER	201/534-4090
Box 97-C, Hwy. #22 West, Whitehouse Station, NJ 08889	
Equipment Sales, Service, Rentals, Air. Private and Group Lessons, Dive Vacations, Wreck Dives.	

NEW YORK

AA AQUA-LUNG CENTER, RICHARDS	212/947-5018
233 W. 42nd St., Times Square, New York, NY 10036	
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ATLANTIS 2	212/924-7556
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2608 Merrick Rd., Bellmore, NY (indoor pool)	516/826-8888
160-09 Jamaica Ave., Jamaica, NY (our 35th year)	718/739-5772
Discount equipment & lessons, refills, rentals, repairs.	
EAST COAST DIVING, INC.	718/979-6056
1500 Hylan Blvd., Staten Island, NY 10305	
PADI 5 star facility, Superior Instruction & Equipment. Personal Dive Trip Planning & Local Wreck Charters.	
ISLAND SCUBA CENTERS, INC.	516/546-2030
74 Woodcliff Ave., Freeport, NY 11520	
Sales, air, rentals, repairs, waterfront store, travel. Instruction, photo equip., rentals, Club Aquarius.	
KINGS COUNTY DIVERS CORP.	718/648-4232
2417 Avenue U, Brooklyn, NY 11229	
Authorized Scubapro dealer. Brooklyn's full service pro shop.	
LAKE GEORGE DIVE RESORT (northern end) May-Oct.	
Silver Bay Lodge	518/543-6528
Route 9-N, Silver Bay, NY 12874	
Dir. on Lake, xmt. food, lounge, docks, air on prem.	
NIAGARA SCUBA SPORTS	716/875-6528
2048 Niagara St. (near Hertel), Buffalo, NY 14207	
Western New York's full service pro dive shop. PADI 5 Star facility. Scubapro & other major brands.	
PAN AQUA DIVING	212/496-2267
166 W. 75th St., New York, NY 10023	
On-site air, equipment, rentals, repair—7 days a week. NAUI, PADI, YMCA: Basic-Instructor. Local, group trips & travel.	
PARAGON SPORTS	212/255-8036
18th Street & Broadway, Manhattan, NY 10003	
GSD—Shenwood—U.S. Divers. Ocean Dynamics—O'Neill—Rip Curt.	
THE WESTCHESTER DIVE CENTERS, INC.	914/937-2685
62 Westchester Ave., Port Chester, NY 10573	
Northern Division, Mahopac, NY 10541	
Area's most comprehensive year-round scuba school.	914/628-1386
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Rolex & all brands repaired & pressure tested. Heuer authorized sales and service. Huge discounts. Ron Gordon proprietor.	

NORTH CAROLINA

ATLANTIC DIVERS INCORPORATED	919/441-1111
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PADI 5 Star Training Facility. Specialists in Diver Education, Trips, Sales & Service.	
EASY STEP CHARTERS/EJW SPORT SHOP	919/247-4725
2204 Arendall St., Morehead City, NC 28557	919/726-2311
Air, Rntls., Repairs, Hydros. Daily walk on charters and grp. rates. Wreck, deep, boat, Search & Recovery, night specialty courses.	
NAGS HEAD PRO DIVE CENTER	919/441-7594
P.O. Box 665, Nags Head, NC 27959	
Wreck U-85, schooners, WWII freighters, tankers, aboard Sea Fox. 50' custom boat, PADI instr., sales, svcs., mtl., air, 5,000 psi.	
SALTSHAKER DIVING SERVICES, INC.	919/726-8852
P.O. Box 275, Morehead City, NC 28557	6 plus divemaster.
Dive over 25 wrecks in our area including the German sub U-352, the U.S. sub USS Tarpon or the luxury steamer SS Proteus.	

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 & Florida trips, wreck dive & fish charters off NC coast.

OHIO

LONG LAKE SCUBA 419/331-3483
 3160 Long Rd., Lima, OH 45807
 PADI training facility.
 Sales, service.

PENNSYLVANIA

DON COOK'S SCUBA EQUIPMENT 717/326-2091
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 Air, certified instruction, PADI, sales, service.
 PADI training facility, pro dive shop. Closed Wednesday.

DUDAS' DIVING DUDS 215/436-0176
 101 Bartrams Lane, West Chester, PA 19382
 Full service NAUI pro facility. PA's largest selection of wet
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HARRISBURG SCUBA CENTER, INC. 717/561-0517
 991-A Peifers Lane, Harrisburg, PA 17109
 5 PADI certified instructors, sales, service, rentals, air, dive
 trips. PADI training facility. Weekdays 6 PM-9 PM, Sat. 9-5.

JOLLY ROGER DIVE SHOP, INC. 717/866-5535
 Rd. #1, Millardville Rd., Richland, PA 17087-0250
 Full service, air, sales, hydro, certified inst.
 diving at shop location.

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I Learned About Diving From That Accident

TEXT AND PHOTOGRAPHY BY BONNIE J. CARDONE

As soon as my head broke the surface of the water I knew I was in trouble. A blackout seemed imminent and a constriction in my chest made breathing difficult. Although I could see, my vision wasn't sharp. I inflated my BC automatically. Since I held my camera in my right hand, I struggled with my left to take off the full facemask. I wanted it off so my buddies would know I was in trouble. As the mask came off my feet tingled and then I could no longer feel them. That scared me. I've got the bends, I thought, but how can that be? We weren't down all that deep or that long.

Tim and I had ascended together and now he was about five feet away. He had been videotaping our dive. Off my face, the mask's built-in regulator freeflowed, attracting his attention. He told me to shut the valve off, but I couldn't remember how. Instead I told him, "I am not okay. There is something wrong with me. I cannot feel my feet." I think I said these exact words about three times. On the boat, Ron and Mario, attracted by the sound of the freeflowing regulator, were looking toward us.

We had been testing diver-to-diver and diver-to-surface communications equipment, contained in the full facemasks. Tim immediately told Jerry, on the boat, that I was in trouble. Our third buddy, Mike, had surfaced ahead of us and was just coming up on the boat's dive platform, about 25 yards away. Told of my difficulties, he dumped his tanks and swam back to help.

Meanwhile, Tim was trying to take my camera from me. We were having a tug of war. I wanted to let go of it and was puzzled that my right hand refused to release it. Then Mike arrived and began to tow me to the boat. We were diving Ship Rock, just minutes from the Catalina Marine Science Center hyperbaric chamber. The hard part, I kept thinking, was getting me to the boat. After that we would go to the chamber and I would be all right.

We reached the boat after what seemed like a long time but was, in reality, only a few minutes. The five people I was with removed my weightbelt and tank and pulled me up on the platform of the 33 foot boat. Mario raised my right arm and I saw, to my surprise, that I still held my camera. "Trust me," he said, prying my fingers off the strobe arm, "I'll take good care of it." He couldn't know my hand was frozen shut. With the camera gone, the fingers curled up in a ball.

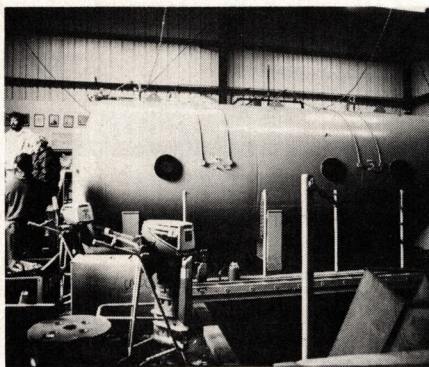
Out of the water and having my fins removed, I saw feet and legs I could not feel. My right side was paralyzed. It was as if I were a ghost with only a head, neck and left forearm materialized. Now I was scared.

They pulled me into the boat, propped my

feet up and covered me with something. I was very cold. Tim kept asking me if I was all right. I wanted to answer him but couldn't. I learned later this is called aphasia and is common in embolism cases.

The boat was underway immediately. Indeed, we hold the speed record: From the time the accident was reported, via our boat's radio, until we reached the chamber, only nine minutes elapsed. As we docked, a man from L.A. County's Baywatch Isthmus stepped aboard and asked me my name. To my astonishment, I told him. He was John Stonier, checking me for aphasia, but it had passed.

They moved me to a stretcher and strapped an oxygen mask on my face. I felt better immediately. While on the stretcher, I realized I could move my left foot. Up in the chamber we



prepared to be pressurized. Just before we started down, some movement returned to my right foot and hand.

Once we were down to 165 feet, a miracle occurred: Everything worked again. My right arm, lower right leg and foot were numb in areas. But, I could breathe with no problems and all of my body parts moved. The diagnosis: Cerebral air embolism.

The first chamber treatment took 12 hours. I soon knew the routine. On pure oxygen for 20 minutes, off for five. The oxygen mask was quite uncomfortable after awhile. An IV dripped a saline solution into my right arm. That was uncomfortable, too. There were many neurological exams. I became quite familiar with Dr. Sipsey's pinwheel—full of tiny needles—used to check for sensory deficits. I didn't have any and felt each and every prick. The hammer that checked my reflexes proved I didn't lack those, either.

I spent the night on the island. The next morning an L.A. County Sheriff's Department helicopter flew the doctor, Wayne (the nurse)


and me back to Long Beach. From there I traveled by car to County/USC Medical Center. (The Catalina chamber is supported by USC and Los Angeles County.) After having a chest X-ray and being tested by a neurologist, I was allowed to go home. My right side felt weak and my head seemed to be full of fog, but I could walk and talk and was very grateful I could do so.

Dr. John Alexander at the Western Center for Hyperbaric Medicine, Northridge Hospital Medical Center (Northridge funded the Catalina chamber last year, funding is marginal this year) wanted to see me Monday morning. To my surprise, he suggested I spend five hours in his chamber. It was the first of six treatments I would have there. I got to know that chamber and its super staff quite well. The treatments restored almost all of the strength to my right side.

On Wednesday I had lung function tests and an expiration/inspiration chest X-ray. Those and the chest X-ray I had at County were normal. The exact cause of my embolism is uncertain. I had made a slow, controlled ascent. However, as I ascended, I was thinking about taking a picture of Mike, who was on the surface. I know I hold my breath when I take pictures U/W. Did I hold my breath that day? I will never know for sure.

At home, I continued to improve—gradually—every day. By the time you read this I expect to be back to normal.

Diving is a very safe sport. I've been doing it for 13 years—mostly off charter boats full of people—and mine is the first serious accident I've seen. The lessons learned from it have been enormous. I will never again confuse an embolism with the bends. I won't dive alone again, either. Had I been alone on May 31, I might not be writing this now. I will never again dive from a boat that does not have a radio. Lastly, I will never ever even consider taking a picture while ascending.

The boat I was on did not have oxygen (invaluable to embolism or bends victims): It does now. Everyone learned something that day. I hope you have, too. Unconsciousness, inability to speak, visual disturbances, weakness or paralysis, or difficulty in breathing—*immediately after a dive*—are all symptoms of an embolism, *even if they last only a few minutes*. If you don't know what to do for an embolism (or bends) victim, find out. The *Dan U/W Accident Manual* will tell you. It costs just \$4 or comes with your DAN membership (\$15). Prompt action by my buddies, Baywatch and Andrew Pilmanis' incredible—and mostly volunteer—Catalina chamber crew saved my life—you could be a lifesaver, too. 

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